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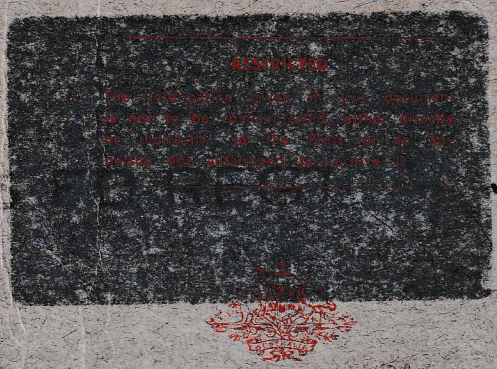

AUSTRALIAN MILITARY FORCES

INFANTRY TRAINING

VOLUME I

INFANTRY PLATOON WEAPONS

PAMPHLET No. 2

FIELDCRAFT AND TARGET DETECTION

(ALL ARMS)

1967

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1967

Army Headquarters,
Canberra, ACT
1/12/67

Prepared and issued under direction of the Chief of the General Staff.

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INFANTRY TRAINING

VOLUME 1

INFANTRY PLATOON WEAPONS

PAMPHLET No. 2

FIELDCRAFT AND TARGET DETECTION

(ALL ARMS)

INTRODUCTION

Aim

1. The aim of this pamphlet is to provide instructors with the information necessary to train soldiers in individual fieldcraft and target detection.

2. Fieldcraft is designed to teach the soldier individual skills which will enable him to:

a. Observe and remain unobserved.

b. Make the best use of ground and cover.

c. Judge distances accurately.

d. Indicate and recognize targets, obey fire control orders, and understand fire discipline.

e. Act as a sentry in a forward area and know exactly what he is responsible for.

f. Move silently, with or without weapons and equipment.

g. Act aggressively on his own, when out of contact with his comrades.

h. Be alert, confident, and cunning whatever situation may arise.

3. Individual fieldcraft training is an excellent way of developing character; and if promising soldiers are allowed to lead

teams in fieldcraft exercises, and act as assistant instructors and umpires, they will learn a lot about leadership.

4. Target detection training practises the soldier in detecting hidden and partially hidden targets, in their natural surroundings, and when revealed by smoke, flash, dust, noise, or movement. Target detection training develops the following skills:

a. Locating camouflaged enemy by scanning terrain and detecting indications which reveal the enemy's location.

b. Remembering the location of a detected target by reference to an identifiable, nearby object.

c. Range estimation to a detected target, preparatory to target indication or the application of fire.

Layout

5. The pamphlet is arranged in two chapters as follows:

a. *Chapter 1* contains the lessons that soldiers must learn, to develop the new skills and techniques to a satisfactory standard.

b. *Chapter 2* contains additional information for the instructor, to help him to understand and present the subject better.

6. Annexes show:

A. Target Detection Range and Master Trial Sheets.

B. Aiming devices.

C. Panorama box.

D. Taped narrative — Introduction to Night Work.

Demonstrations

7. Demonstrations must be carefully prepared and thoroughly rehearsed, whether they are on a large or small scale. Poor demonstrations are probably worse than no demonstrations at all.

Length of Periods

8. Fieldcraft and target detection do not lend themselves to strict 40-minute periods. Many lessons require much more time and others are more suited to day and night exercises.

Safety

9. When using blank ammunition on exercises, a minimum safety distance of 20 metres must be observed between the firer and the nearest troops on the line of fire.

CHAPTER 1

INSTRUCTIONAL LESSONS

LESSON 1 — ELEMENTARY OBSERVATION — PERSONAL CAMOUFLAGE AND CONCEALMENT

Aim

1. To teach and exercise the squad in:
   a. Elementary observation.
   b. Personal camouflage and concealment.

Student Performance Objectives

2. At the completion of this lesson, students must be able to:
   a. State the meanings of the terms, cover, concealment, observation, and detection.
   b. Search a given area and detect objects which violate the basic principles of concealment.
   c. Camouflage themselves correctly.
   d. Select and occupy a position in which they are to remain concealed.

Stores

3. **a.** Aiming devices.
   b. Netting.
   c. Scrim.
   d. Camouflage cream.
   e. Burnt wood.
   f. Hessian.
   g. Assorted items of military equipment.

Period

4. Two 40 minute periods — lesson.

Notes

5. Carefully select a piece of ground which includes hollows, bushes, trees, banks, hedges, and preferably some artificial features such as windows and doorways.

6. Place out the items of equipment so that some are easy to detect, others difficult, and so that they provide varying degrees of contrast of colour, tone, surface, shape and shadow.

7. Students and demonstrators are to be dressed in battle order.

8. Demonstrations must be carefully rehearsed, using trained soldiers as fatigue men. The rehearsal is to take place at a time of day the same as that scheduled for the actual lesson. This should achieve similar conditions of light and shadow to enable the instructor to carefully site his fatigue men.

Preliminaries

9. A last minute check of dress and positions of the demonstrators.

10. Safety precautions on all weapons and equipment.

Approach

11. *Explain the aim and continue.* The purpose of this type of training is to mould the individual into a cunning and self reliant fighting man, capable of playing an effective role in a fighting team; and to build, and maintain in him, the aggressive spirit — the will to close with the enemy and kill or capture him.

12. The following terms are used throughout fieldcraft and target detection training and therefore it is important that their meanings are clearly understood:

a. *Cover.* This is protection from the fire of hostile weapons. Ditches, hollows, reverse slopes, etc, give protection from flat-trajectory fire but only provide partial protection from high-angle fire.

b. *Concealment.* This is protection from hostile observation; it may be natural or artificial. Natural concealment is provided by the surrounding growth, such as trees, bushes, grass, etc, and requires little or no change to provide concealment. Artificial concealment is provided by the use of nets, hessian, scrim, camouflage cream, and other similar materials.

c. *Observation.* This is the technique of seeing through the enemy's concealment, and taking note of his every move.

d. *Detection.* This is to discover the presence and location of the enemy, by careful observation, or by the enemy disclosing his location with smoke, dust, flash, noise, or movement.

13. Achieve the first student performance objective by questions from and to the squad.

Elementary Observation

14. *Explain and demonstrate, using obvious and not so obvious examples.* The intelligent observer will detect the presence of an enemy when any of the following basic principles of concealment are violated:

a. *SHAPE.* Military equipment and the human body are familiar outlines to all soldiers, and can be recognized instantly, particularly when they are in contrast with the surroundings. Distinctive shapes, which are easily detected unless concealed are:

(1) The steel helmet.
(2) The web equipment.
(3) Personal weapons.

b. *SHADOW.* Objects which are concealed in sunlight can often be detected by the shadow that they cast. Objects which are concealed in shadow are harder to detect and do not cast a shadow of their own. Objects are often revealed when the shadow concealing them moves.

c. *SILHOUETTE.* Anything silhouetted against a contrasting background is conspicuous. Any smooth, flat background, such as water, a field, or the sky, will silhouette a target.

d. *SURFACE.* Any surface which contrasts with its surroundings is conspicuous, particularly if it shines. Targets with uncamouflaged skin and helmets are easily detected.

e. *SPACING.* Natural objects are rarely, if ever, regularly spaced. Objects which are regularly spaced are conspicuous.

f. *MOVEMENT.* Sudden movement attracts the eye and will reveal the location of an otherwise well concealed object. Movement which is executed slowly and carefully is much less likely to disclose a well concealed position.

15. The way to detect targets is to:

a. Immediately search the whole area for about 30 seconds to detect any obviously dangerous target, and then:

b. Divide the area of observation into narrow strips, about 50 metres deep, and search them from right to left. First search the ground nearest to you to detect the most dangerous enemy. Then search from left to right over a second strip that is farther out but which overlaps the first

strip. Continue in this way until the whole area has been searched. See Figure 1. Search any suspicious spot more closely.

SEARCHING THE AREA OF OBSERVATION

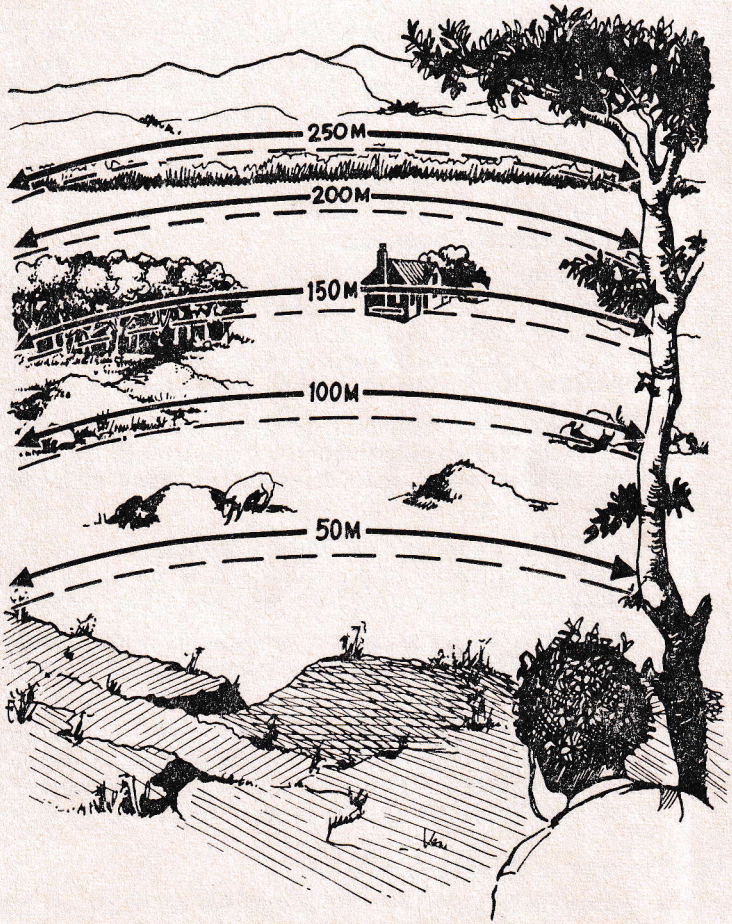


Figure 1

16. Achieve the second student performance objective by exercising the squad in searching an area of observation and locating military objects which are concealed but violate the basic principles of concealment.

17. Each man should write down the object he has detected and the reason why it was discovered.

18. If there is any doubt that the man has discovered any object, have him aim at it, using the aiming device. See Annex A.

Personal Camouflage and Concealment

19. *Explain.* The soldier must possess the skill for concealment combined with the aggressive determination of a predatory animal. The enemy is the prey. Concealment is an aid to hunting and destroying him.

20. The well camouflaged soldier locates himself in ground which will hide his shape and shadow. He uses the growing vegetation to break his outline. His visible surface blends with the surrounding contrasts and tones. No needless movement reveals his intent to attack.

21. *Explain and demonstrate.* Personal camouflage is achieved as follows:

a. Exposed skin reflects light and contrasts with surrounding surfaces. Irregular splotches of camouflage cream, mud, burnt wood or lampblack will rectify this. Try to break up the outline of the face, and mask the eyes and cheek bones. Camouflage all other exposed skin in a similar way. Use a darker treatment of the skin for night work. See Figure 2.

b. The helmet has a distinctive outline. The first step in camouflaging it is to alter the surface and break up its regular silhouette. Use irregular splotches of mud or a matt paint to dull the surface, or improvise a helmet cover from hessian or canvas and colour it to blend with the background. Stick foliage in the helmet cover and ensure that it breaks the outline of the helmet. If covers cannot be made, foliage can be held in place using a large rubber band, or string. See Figure 3.

c. Modify the appearance of the clothing and web equipment by splotching the surface with mud, etc, and breaking up the outline, using foliage. Pay particular attention to the boots.

d. Personal weapons can be camouflaged by binding scrim or hessian around shiny metal or wooden parts. Ensure that none of it hinders the handling of the weapon.

22. Achieve the third student performance objective by squad practice. Allot each man an area and have him camouflage himself in preparation for remaining concealed in that area. Have the squad members criticize each other's camouflage.

FACIAL CAMOUFLAGE

Figure 2

CAMOUFLAGING THE HELMET

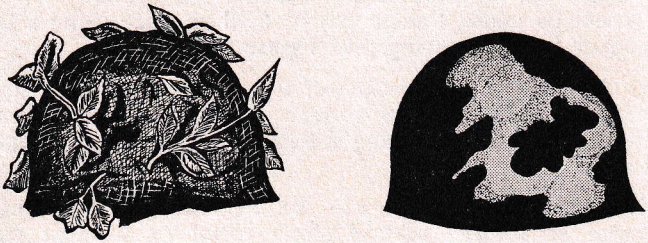


Figure 3

23. *Explain.* A carefully camouflaged soldier must select a position which provides the necessary field of fire, and makes it difficult for the enemy to detect and destroy him.

24. *Explain and demonstrate concealment, using positions which bring out the following points*:

a. Look around or through concealment, not over it. See Plate 1. If there is no choice but to look over it, try to avoid being silhouetted. See Plate 2.

LOOKING THROUGH OR AROUND CONCEALMENT

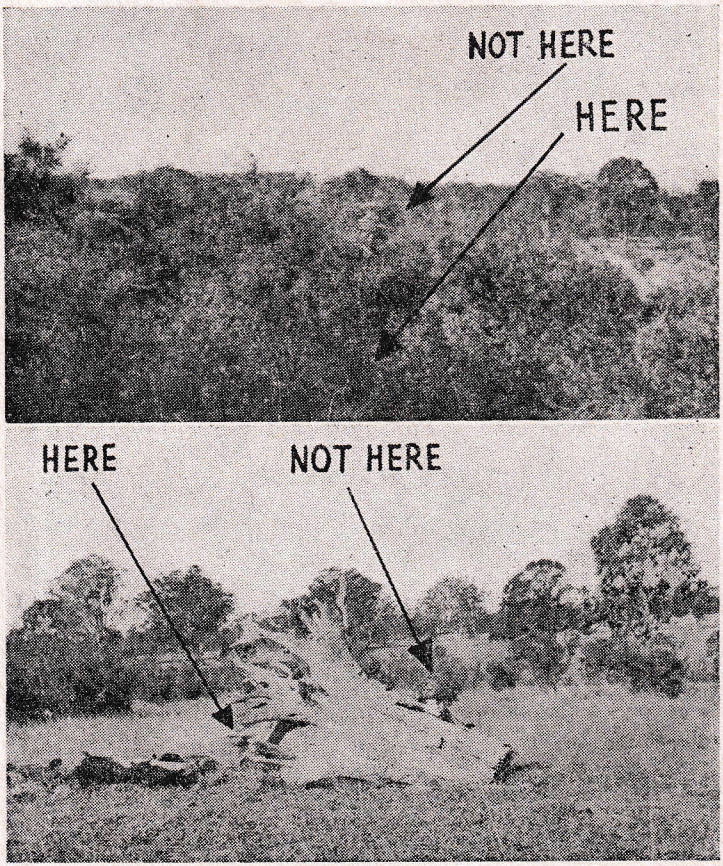


Plate 1

b. Avoid skylines.

c. Make use of shadows, and remember that positions in the sun may be disclosed by a shadow being cast. See Plate 3. Shadows move with the sun.

LOOKING OVER CONCEALMENT

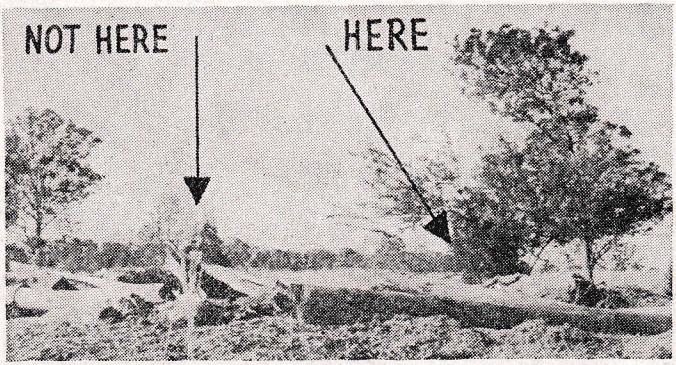


Plate 2

USE OF SHADOW

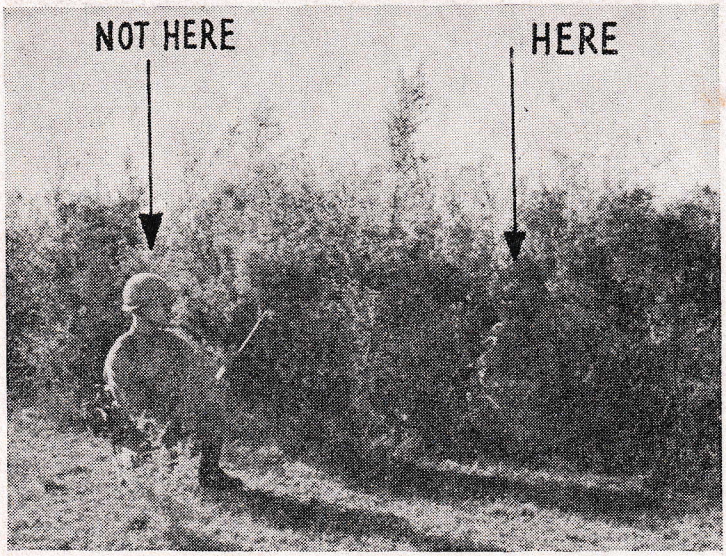


Plate 3

d. Choose a background which blends with your overall appearance. See Plate 4.

BACKGROUND

Plate 4

e. Avoid isolated cover; it is usually conspicuous, kept under observation, and may even be a reference point for the purpose of giving fire orders. See Plate 5.

f. Enter and leave a concealed position, without being seen.

g. When movement is essential, move slowly and carefully.

25. Achieve the fourth student performance objective by having half the squad conceal themselves from the other half, who are to act as observers.

26. Have the observers criticize any position detected and state why the member was discovered. Order the undetected mem-

AVOID ISOLATED COVER

Plate 5

bers to stand up and reveal their positions. Change the groups over and repeat the procedure.

27-28. Reserved.

Conclusion

29. Questions from and to the squad.

30. Sum up the main points, which are:
    - **a.** Meanings of the terms used.
    - **b.** The basic principles of concealment.
    - **c.** Searching ground.
    - **d.** Camouflage and concealment.

31. Summarize the important points as follows:
    - **a.** Observe and remain unobserved.
    - **b.** Notice and remember details.
    - **c.** Understand the meaning of what is observed and learn to make the right deductions.

LESSON 2 — JUDGING DISTANCE, AND INTRODUCTION TO TARGET DETECTION

Aim

32. To teach and exercise the class in:

a. Judging distance by the unit of measure or appearance methods.

b. The detection, location, and estimation of range to realistic battlefield targets.

Student Performance Objectives

33. At the completion of this lesson, students must be able to:

a. Judge distances accurately, at ranges up to 400 metres, using the unit of measure method.

b. Judge distances accurately, at ranges beyond 400 metres, using the appearance method.

c. Detect realistic battlefield targets, estimate the range to them, and remember where they are located.

Stores

34. **a.** Aiming devices.

b. Quantity of large flags.

c. Quantity of small flags.

d. Master trial sheets.

e. Answer sheets (mounted on clip-boards).

f. Pencils.

g. Public address system.

h. 20 Rounds 7.62mm Blank

i. Camouflage material.

Period

35. Two hours - lesson.

Notes

36. A TD Range is required. See Annex B, and an effective loudspeaker system should extend down range.

37. Fatigue men, and any assistant instructors to be used, are to be carefully rehearsed, preferably at a time of day the same as that scheduled for the lesson.

38. Position large flags at 100 metres distance from a central

view point, so that they are seen across varying types of ground. Choose a number of objects up to 400 metres distant, and mark off each 100 metres between the view point and the objects. Leave a small flag near these 100 metre intervals, out of sight from the viewing position.

39. Position vehicles, and any other large military objects, at distances of up to 600 metres from the view point, so that they are seen across varying types of ground.

40. The staff required for the successful conduct of this lesson, and their various duties, are as follows:

a. The Principal Instructor (PI):

(1) Rehearsal of assistants and fatigue men.

(2) Conduct of the lesson.

b. Two Assistant Instructors (AI):

(1) Controlling observers.

(2) Assist in scoring.

(3) Assist the PI as required.

c. Three fatigue men, dressed in battle order, are to occupy target locations and act as hostile targets, executing actions similar to those detailed in the Sample Master Trial Sheet. See Appendix 1 to Annex B.

Preliminaries

41. Carry out safety precautions on all weapons to be used. Revise the basic principles of concealment, and indications which disclose the presence of an unseen enemy.

Approach

42. *Explain the aim and continue.* To survive in battle it is essential that every soldier is capable of detecting the location of a hidden enemy, estimating the correct range to him, and either destroying him with aimed fire or indicating his location to others.

43. A cunning enemy will use all the tricks of fieldcraft to remain hidden, and therefore he will not be easy to locate, even when firing his weapon. When his location is detected, it is important to be able to estimate the range correctly, so that fire will be effective and indications accurate.

Judging Distance

44. *Explain and demonstrate.* To judge distance by the unit of measure method:

a. Visualize a distance of 100 metres on the ground. Calculate how many 100 metre units would fit between the observer and the distant object.

b. This method gives acceptable results when:

(1) The observer can see all of the intervening ground.

(2) The distance to be estimated is not greater than 400 metres.

45. Have the class view the large flags placed out at 100 metres, across various types of ground.

46. Achieve the first student performance objective by practising the class as follows:

a. Exercise them in positioning themselves 100 metres from a given object. Point out why errors are made and practise them until they achieve consistent results.

b. Exercise them in judging distance to objects placed out before the lesson. Get the answers and raise the intermediate flags to show the correct solution. Discuss the reasons why under or over estimation took place.

47. *Explain.* Another method of judging distance to an object is to study what it looks like in relation to its surroundings; this is called the appearance method. To become proficient in judging distances by this method a great deal of practice is required, under varying conditions of ground and observation.

48. Conditions that affect the appearance of objects are as follows:

a. Objects seem closer than they are, when:

(1) The light is bright, or the sun is shining from behind the observer.

(2) They are large in comparison with the surroundings.

(3) There is dead ground (depressions) between the object and the observer.

(4) They are observed along an elevated line of sight.

b. Objects seem farther than they are, when:

(1) The light is bad, or the sun is shining in the observer's eyes.

(2) They are small in comparison with the surroundings.

(3) Looking across a valley, down a road, or along a track through a wood.

(4) The observer is in the lying position.

49. Achieve the second student performance objective by practising the class as follows:

a. Show the appearance of men, and larger objects such as vehicles or crew served weapons, at ranges up to 600 metres.

b. Practise them in estimating ranges by the appearance method. Concentrate mainly on the appearance of men at ranges between 400 and 600 metres.

50. Face the class away from the TD Range area and position the three fatigue men, well concealed, in fire positions within about 50 metres of the observation line. Question the class about target indications.

Target Indications — Demonstration

51. Turn the class about and have them search the range area for about one minute.

52. *Explain and demonstrate.* In searching an area, an observer must constantly look for targets which are dangerous to him. He must be constantly alert to avoid being surprised by the enemy.

53. Inform them that three enemy are at that moment prepared to shoot them from a close range, and that the observers have one minute to locate the enemy. If they cannot detect them they are to locate three areas they consider to be the most potentially dangerous.

54. Question the squad as to the number of enemy detected. Continue the demonstration as follows:

a. Order *"TARGETS STAND UP"*.

b. Briefly ascertain how many would have discovered any or all of the enemy or their locations.

c. Order "OBSERVERS — ABOUT TURN — TARGETS DOWN". Find out how many observers think that they can remember all target locations. Confirm this by ordering *"OBSERVERS — ABOUT TURN"* and have them briefly search for the enemy again.

d. Well camouflaged and motionless enemy are hard to detect. The target may move slowly but detection is still difficult. Order *"TARGETS — MOVE SLOWLY UP AND DOWN"*.

e. Side to side movement is easier to detect. Order "TARGETS — MOVE SLOWLY SIDE TO SIDE".

f. Quick or abrupt movements attract attention and

detection is much easier. Order *"TARGETS — MAKE QUICK MOVEMENTS"*.

g. The sound of a shot directs your attention to the area from which it came. If the observer is looking in that direction, the flash and/or smoke would assist detection. Order *"TARGETS — No. 1 (2, etc) FIRE — STAND UP"*.

55. *Explain.* This demonstration was to show the observers the aids to detecting targets. In order to survive, the enemy must be detected before he discloses his position by firing. Further practice in target detection will improve the observer's ability to detect the enemy before he can deliver aimed fire.

56. Turn the squad about and have the fatigue men move to positions ready for their next trial.

Remembering Target Locations

57. *Explain.* One of the most important battle techniques is remembering the locations of targets, particularly when confronted with multiple targets.

58. When a target indicates its location, or was seen but disappeared, select some easily visible point on the ground where the target is, such as a bush, tuft of grass, etc, and use this as an *"aiming point"* for the purpose of delivering effective aimed fire. *Demonstrate this as follows*:

a. Order *"OBSERVERS — ABOUT TURN"*.

b. *"TARGET No ..... GET BEHIND A BUSH"*.

c. The base of the bush can be used as the aiming point for the observer to fire at the enemy.

d. The bush is prominent, therefore the observer can search the rest of the area and still remember where that enemy disappeared.

59. *Explain.* Often it will not be possible to remember an aiming point, because there is nothing clearly distinguishable where the target was indicated or disappeared. In this case select the closest suitable object that can be remembered, visualize the distance it is from the target, and use it as a *"reference point"*. The observer knows that his point of aim is to be ..... metres from the reference point. *Demonstrate this as follows*:

a. Order *"TARGET No .... — MOVE THREE METRES FROM THE BUSH AND DISAPPEAR"*.

b. The bush now becomes a reference point because there is no aiming point.

c. Fire can be applied by aiming three metres in ..... direction from the bush.

60. *Explain.* An important aspect to remembering target locations is the accurate estimation of range. Question the squad to determine their estimation of range to where the target disappeared.

61. Achieve the third student performance objective by conducting trials similar to those shown in Appendix 1 to Annex B, Sample Master Trials Sheet.

62. Issue each student with an Answer Sheet as shown in Appendix 2 to Annex B. *Explain the details of the detection exercise, as follows*:

a. There are to be up to 10 trials, and each trial is to consist of four phases as follows:

Phase	**Target Action**
1	— Concealed and motionless.
2	— Slow movement.
3	— Fast movement, SURFACE or SILHOUETTE violation.
4	— Fires blank.

b. The observer is allowed 30 seconds in each phase to detect the target, select the aiming point and aim, step back from the aiming device and place a *"tick"* in the appropriate column of the answer sheet. Place a *"X"* in the column for each phase that the target was not detected.

c. Divide the observation area into left, right, and centre of arcs, using the letter panels as references, and ensure that the squad fully understand the division of the area.

d. The following is an example of how each trial is to be conducted:

(1) *"LEFT OF ARC — TRIAL 1, PHASE 1 — OBSERVE"*.

(2) After 30 seconds *"RECORD"*.

(3) Allow a few seconds to mark the answer sheet then *"PHASE 2 — OBSERVE"*.

(4) After all four phases are completed the target is ordered to *"STAND UP"* and check the answer sheets. Observers select a reference or aiming point, and are ordered to *"ABOUT TURN"* while the

target gets into his original position on the order *"TARGET DOWN"*.

(5) Assistant instructors knock the aiming devices out of line, the observers are ordered to *"ABOUT TURN"* and aim at the spot where they recall sighting the target. Again order *"TARGET — STAND UP"* and check the accuracy of the aims.

(6) Where necessary, turn the observers around while the target men change location.

63 to 65. Reserved.

Conclusion

66. Questions from and to the class.

67. Sum up the main points, which are:

a. *Judging distance*:

(1) Unit of measure.

(2) Appearance method.

b. *Target detection*:

(1) Target indications.

(2) Remembering target locations.

(3) Aiming and reference points.

c. The results achieved by the answer sheets and the improvements to be made.

LESSON 3—INDICATION AND RECOGNITION OF TARGETS

Aim

68. To teach and exercise the squad in:

a. Organizing an arc of fire.

b. Indication and recognition of targets.

Student Performance Objectives

69. At the completion of this lesson, students must be able to:

a. Organize an arc of fire.

b. Indicate targets by direct methods.

c. Indicate targets by reference points.

d. Indicate targets by reference points, clock rays, and hand angles.

e. Report when a target is not recognized and be able to indicate a target using tracer ammunition.

Stores

70. a. Aiming devices.

b. Landscape targets.

c. Clock ray diagram.

d. Hand angle diagram.

Period

71. Three 40 minute periods — lesson.

Notes

72. Choose the ground carefully; select realistic targets, that men might have to indicate and recognize in battle, and at realistic ranges.

73. Construct a diagram of a clock ray to use on a landscape target. The best type of diagram is black figures on talc.

74. Carefully prepare example indications to bring out the methods to be taught.

75. Organize the arc and reference points.

Preliminaries

76. Revise judging distance.

Approach

77. *Explain the aim and continue.* The best fire order is the one that gets the fire onto the target in the shortest possible time, and usually the most difficult part of any fire order is the indication of the target. It follows then that successful fire control will be governed, in the main, by the standard of target indication and recognition.

Organization of an Arc of Fire

78. *Explain and demonstrate.* An arc of fire is an area of ground allotted to an individual or a sub-unit to cover with effective fire.

79. Using a landscape target, show how the arc of fire is defined as follows:

a. Left and right of arc. These are imaginary lines pass-

ing through easily identified objects in the landscape, and mark the left and right limits of responsibility.

b. The axis of arc is an imaginary line passing through an easily identified object in the centre of the landscape, and marks the centre of the area of responsibility.

c. On occasions a Near (or Far) limit may be indicated. This implies that only the ground beyond (short of) this line, and within the arc, need be considered.

d. Reference points. These are prominent fixed objects, selected throughout the arc. Points to note are:

(1) Each one should have a single easily recognizable name, eg, *"COPSE"*.

(2) The range to a reference point must be known by all who might use it.

(3) A large object, such as a copse or house, must have a definite point established, which is to be for reference, eg, the right edge.

(4) Reference points should be a reasonable distance apart, but not greater than 500 mils.

(5) Reference points should not be on the right or left of arc, near or far limits, or the sky line.

80. An example of an arc of fire being organized, may sound as follows:

"LOOK TO YOUR FRONT — OLD SILO, AXIS OF ARC — THREE-QUARTER RIGHT, COPSE, RIGHT EDGE, RIGHT OF ARC — HALF LEFT, RED HOUSE, LEFT EDGE, LEFT OF ARC — FAR LIMIT — FARTHEST BANK OF RIVER — REFERENCE POINTS — TWO HUNDRED, AXIS, CHURCH, RIGHT BOTTOM CORNER, CALLED CHURCH — ONE FIFTY, QUARTER RIGHT, TWIN POPLARS, RIGHT POPLAR, CALLED TREES".

81. Achieve the first student performance objective by practising the squad in organizing an arc of fire. End the practice with the arc organized that it is intended to use during the lesson.

Preliminaries to Indication

82. *Explain and demonstrate.* The observer, before indicating a target, must decide on:

a. What he is going to call it, ie, what the target appears

as to the naked eye. Diggings may appear as a brown patch, and a camouflaged vehicle could appear as a dark clump.

b. The simplest, quickest, and most certain method of indication.

Direct Indication

83. *Explain and demonstrate.* Obvious targets are indicated by the direct method as follows:

a. The range is given to indicate how far to look.

b. A direction is given in accordance with those shown in Figure 4. The axis of arc is given as *"AXIS"*.

c. The target is described briefly but accurately.

84. A direct method example might be:

"TWO FIFTY — HALF RIGHT — LONE BUSH".

DIRECT METHOD

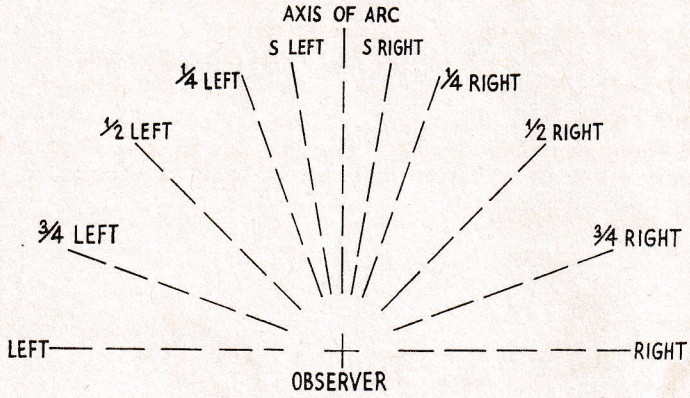


Figure 4

85. Achieve the second student performance objective by squad practice.

Reference Point

86. *Explain and demonstrate.* Less obvious targets can be indicated using reference point and direct methods combined.

a. The range to the target is given.

b. The reference point is nominated and used as an axis.

c. A direction is given as in the direct method.

d. The target is briefly but accurately described.

87. An example of this method might be:
"THREE HUNDRED — TREE (the reference point) — SLIGHTLY RIGHT — SMALL BUSH (the target)".

88. Achieve the third student performance objective by squad practice.

Clock Ray and Hand Angles

89. For the difficult targets, the observer may use a reference point in conjunction with a clock ray, as follows:

a. Give the range to the target.

b. Nominate the reference point.

c. Imagine the reference point as the centre of a *"vertical"* clock face. Imagine a straight line from the reference point to the target and state the direction and *"time"* (to the nearest hour).

d. Describe the target briefly but accurately.

90. An example of this method might be:
"ONE FIFTY — WINDPUMP (the reference point) — RIGHT, FOUR O'CLOCK — ROCKS (the target)".
See Figure 5.

91. *Explain and demonstrate.* The distance in mils from a reference point to a target may be of great assistance in

CLOCK RAY METHOD

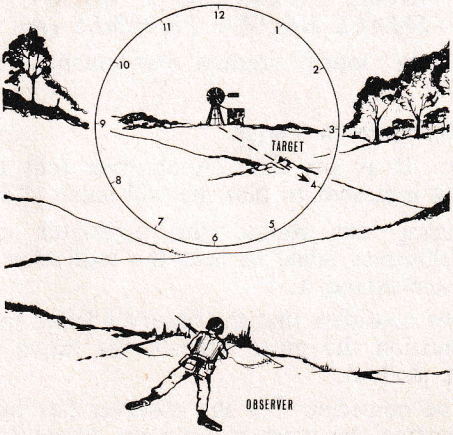


Figure 5

indicating a difficult target. Approximate hand angles, with the arm fully outstretched, are as shown in Figure 6.

HAND ANGLES

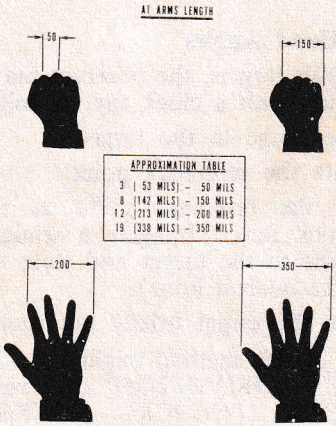


Figure 6

92. An example of this method might be:
"TWO HUNDRED — TREE (the reference point) — LEFT, EIGHT O'CLOCK — ABOUT SEVENTY MILS — SMALL BROWN PATCHES (the target)".

93. Achieve the fourth student performance objective by squad practice.

Failure to Recognize a Target

94. *Explain.* If at any time an observer fails to recognize a target being indicated to him, he will shout, *"AGAIN".*

95. On hearing this report, the originator must decide whether the observer failed to hear the indication or whether he failed to understand it:

a. If he considers that the observer failed to understand the indication, he must indicate the target again by a different method.

b. If he considers that the observer has failed to hear the indication, he must indicate the target again so that all can hear.

Indication by Firing

96. Tracer may be used to indicate an extremely difficult target, or to indicate a target to a supporting arm. An example is: *"THREE HUNDRED — WATCH THIS TRACER — WHERE IT HITS, ENEMY"*.

97. Achieve the fifth student performance objective by squad practice using all methods.

98 to 99. Reserved.

Conclusion

100. Questions from and to the squad.

101. Sum up the main points, which are:

a. Organizing an arc of fire.

b. Indication and recognition of targets:

(1) Direct method.

(2) Reference point method.

(3) Reference points, clock ray and hand angles.

(4) By firing.

c. Failure to recognize an indicated target.

LESSON 4 — AIDS TO JUDGING DISTANCES — CONSTRUCTION OF RANGE CARDS

Aim

102. To teach and exercise the squad in:

a. Judging distance by:

(1) Halving.

(2) Bracketing.

(3) Key ranges.

(4) Group average.

b. Construction of range cards.

Student Performance Objectives

103. At the completion of this lesson, students must be able to :

a. Judge distance by:

(1) Halving.

(2) Bracketing.
(3) Key ranges.
(4) Group average.

b. Construct a range card.

Stores

104. **a.** Range cards on clip boards.
b. Pencils.
c. Compasses.

Period

105. One 40 minute period — lesson.

Notes

106. The ranges to all objects to be used, for judging distance and the construction of range cards, are to be accurately determined.

107. Exercise the squad in judging distances from realistic firing positions.

Preliminaries

108. Revise judging distance by the unit of measure and appearance methods. Organize an arc of fire.

Approach

109. *Explain the aim and continue.* At times it is not always possible to judge distances by the unit of measure or appearance methods. For this reason it is necessary to know some other aids to determining range.

110. *Explain and demonstrate each of the following aids*:

a. *Halving.* To use this aid, choose a point which appears to be about half way to the target; estimate the range to this point by unit of measure, and then double it.

b. *Bracketing.* To determine range by this method:

(1) Estimate the maximum range that the target could be at.

(2) Estimate the minimum range that the target could be at.

(3) Add the ranges in (1) and (2) together, and halve the result.

c. *Key ranges.* This method is applied simply by estimating ranges to targets which are close to objects of known range.

d. *Group average.* This method is applied simply by taking the average of estimates made by a group of people trained in judging distances.

111. Achieve the first student performance objective by squad practice.

Construction of Range Cards

112. *Explain and demonstrate.* A range card should be prepared whenever a position is occupied long enough for one to be constructed. A range card is only a sketch and need not be drawn to scale, but the data on it must be accurate.

113. If a position is not occupied for long, the data on the range card remains simple, but as time goes by, more information is accumulated and is recorded on the card until a large amount of data is available. Such information may include:

a. Prominent landmarks.

b. Likely enemy approaches.

c. Ranges to each.

114. A range card enables quick, accurate reference to be given to any target so that it can be quickly engaged. It also ensures that dangerous areas are not overlooked. Although a section has an arc of fire, it is normal to record ranges in every direction, so that it is prepared to conduct all round defence; hence the design of the card.

115. Any piece of paper may be used as a range card, and a small tattered card is far better than none at all. Description of the card is as follows:

a. On the face are drawn six concentric circles.

b. On the bottom left hand corner is provision for explanatory data, eg:

(1) Point from which it is made out.

(2) Method of obtaining ranges.

(3) Who made it out.

(4) Date.

116. Construction is as follows:

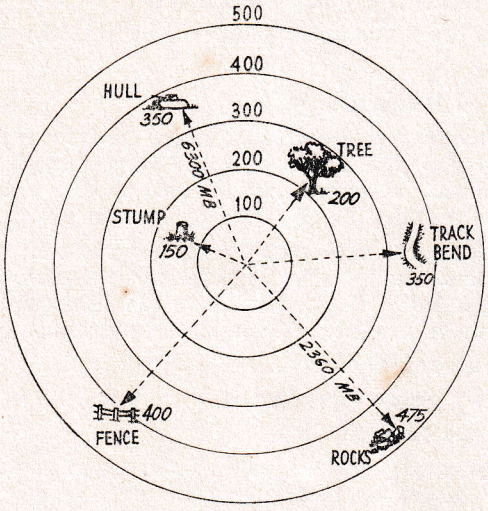
a. Describe accurately the point from which it is made out (can be stated as a grid reference).

b. Put in the range each circle is to represent.

c. Choose two unmistakable objects, one to the front and one, if possible, behind, and draw a thick setting ray to each.

COMPLETED RANGE CARD

AAF–C75



Point from which made out GR 173821
Method of obtaining ranges GROUP AVERAGE
Made out by J. Clover Cpl Date 1–7–1969

Figure 7

d. Decide on the objects that ranges are to be recorded to.

e. Set the card by the setting rays and draw in rays in the direction of all other objects.

f. On the left, add the name (eg, stump, etc).

g. On the right, add the range to the object. If the range information has been verified by firing, enclose the figure in a small rectangle.

h. Complete *"Method of obtaining range"*, eg,
"M60 firing".
"Paced Out".
"Group average".

i. Sign and date the card.

117. Other information which may be recorded on a range card includes:

a. Right and left of arc.

b. The *"open-fire"* line.

c. Magnetic and/or grid north.

118. The card is best done in pencil because amendments (which are inevitable) are more easily made.

119. Achieve the second student performance objective by exercising the class in the construction of range cards.

120 to 121. Reserved.

Conclusion

122. Questions from and to the squad.

123. Sum up the main points, which are:

a. Aids to judging distance:

(1) Halving.
(2) Bracketing.
(3) Key Ranges.
(4) Group average.

b. Construction of range cards:

(1) Halving.
(2) Bracketing.
(3) Key Ranges.
(4) Group average.

c. Construction of range cards.

LESSON 5 — INDIVIDUAL DAYLIGHT MOVEMENT WITH ARMS

Aim

124. To teach and exercise the squad in individual field movement with arms.

Student Performance Objectives

125. At the completion of this lesson, students must be able to:

a. Crawl, unobserved, on hands and knees or with the body close to the ground.

b. Rush quickly from one concealed position to another.

c. Advance quietly at the walk when contact with the enemy is imminent.

Stores

126. **a.** Camouflage materials.

b. General Purpose Machine Guns.

Period

127. One 40 minute period — lesson.

Notes

128. Students and demonstrators are to be dressed in battle order and carry rifles.

129. An area is required which has both hard and soft ground, so that students experience movement on both types of ground.

Preliminaries

130. Safety precautions on all weapons. Revise personal camouflage and the basic principles of concealment.

Approach

131. *Explain the aim and continue.* To move into or out of a concealed position, without being seen, it is essential to know how to move according to the amount of cover available.

General

132. Important points to be observed when executing any undetected movements are:

a. Before leaving a place of concealment, select the position it is intended to move to and the best route to take to get to it.

b. Tall grass provides concealment, but moving through it may make it wave with unnatural motion, thus attracting the enemy's attention.

c. Remain still for a few minutes and observe after disturbing any animals or birds.

d. Take advantage of any distractions, such as explosions, loud noise, low flying aircraft, etc, to cover any movement.

e. Take advantage of fog, smoke or haze to assist in concealing movement.

Crawling

133. *Explain and demonstrate.* To move, unobserved, behind cover 2 or 3 feet high, it is necessary to crawl on the hands and knees. See Plate 6:

CRAWLING ON HANDS AND KNEES

Plate 6

a. Get down on the knees and hold any weapon in the left hand, at the point of balance.

b. Clench the right fist and place it on the ground to support the forward part of the body.

c. Crawl forward, keeping the body as low as possible and the head only high enough to be able to observe along the intended route. If necessary, use the right hand to move twigs, etc, out of the way to avoid making unnecessary noise.

d. The movement can be executed with considerable speed, but it must be remembered that fast movement increases the amount of noise.

134. To move, unobserved, behind very low cover, it is

necessary to crawl with the body as close as possible to the ground. See Plate 7.

a. Lie on the ground with the weapon cradled in the arms.

b. Propel the body along by advancing alternate elbows and knees. Keep the head only high enough to observe along the intended route.

c. Keep the muzzle of the weapon clear of the ground.

CRAWLING CLOSE TO THE GROUND

Plate 7

135. Achieve the first student performance objective by practising the squad crawling on hands and knees, and with the body close to the ground, with the rifle and the GPMG.

Rushing

136. *Explain and demonstrate.* The rush is the fastest means of moving from one position to another and is usually used when crossing ground which provides no concealment whatsoever. It is desirable to make rushes of only a few seconds, where possible. This will prevent the enemy from having sufficient time to effectively aim his weapon. Rushing is achieved as follows:

a. Carefully select the position it is intended to rush to.

b. Jump up quickly and move as fast as possible, by the shortest route, to the new position.

c. Drop quickly to the ground, breaking the fall on the knees and with a hand.

d. Crawl away to a concealed location and take up a position of observation.

137. Achieve the second student performance objective by practising the squad at making short rushes with the rifle and the GPMG. At the end of the practice, order *"READY"*.

138. *Explain and demonstrate.* When advancing in close contact with the enemy it is essential to be able to walk silently and stealthily. See Plate 8:

a. Keep the weapon ready (hip firing position for the GPMG) so that fire can be produced instantly.

b. Move slowly and deliberately, maintaining the body in a balanced position at all times. To move really quiet on hard ground, put the edge of the sole of the boot on the ground first.

c. Keep the head up and observe in all directions, the weapon always following the general line of sight.

d. Be continually alert and ready to fire or get into cover instantly. Always observe and note good fire positions and cover while on the move.

e. Take great care, when crossing small obstacles, that:

(1) The weapon will not be accidentally discharged in the process.

(2) The body is not off balance so that fire cannot be produced instantly.

139. Achieve the third student performance objective by practising the squad, walking with the rifle and the GPMG.

140 to 141. Reserved.

THE WALK

Plate 8

Conclusion

142. Questions from and to the squad.

143. Sum up the main points, which are:

a. Crawling:

(1) On hands and knees.

(2) With the body close to the ground.

b. Rushing.

c. Walk.

LESSON 6 — DETECTION OF SINGLE MOVING TARGETS

Aim

144. To teach and exercise the class in the detection of single moving targets.

Student Performance Objectives

145. At the completion of this lesson, students must be able to:

a. Explain how and when to engage a moving target once it has been detected.

b. Detect a moving target and perform any of the following actions, as necessary:

(1) Engage it while it is moving, or using an aiming point when it goes to ground.

(2) Remember its location by reference point.

(3) Indicate it to others.

Stores

146. **a.** Aiming devices.

b. Master trial sheets.

c. Public address system.

d. Camouflage material.

e. 20 Rounds of 7.62mm Blank.

Period

147. One hour — lesson.

Notes

148. A TD Range is required, See Annex B, and an effective loudspeaker system should extend down range.

149. Fatigue men, and any assistant instructors to be used, are to be carefully rehearsed, preferably at a time of day the same as that scheduled for the lesson.

150. The staff required for the successful conduct of this lesson, and their various duties, are as follows:

a. The Principal Instructor (PI):

(1) Rehearsal of assistants and fatigue men.

(2) Conduct of the lesson.

b. Two Assistant Instructors (AI):

(1) Controlling observers.

(2) Assist in scoring.

(3) Assist the PI as required.

c. Three fatigue men, dressed in battle order, are to occupy target locations and act as hostile targets, executing actions similar to those detailed in the Sample Master Trial Sheets. See Appendix 3 to Annex B.

Preliminaries

151. Carry out safety precautions on all weapons to be used. Organize the arc to be used, including reference points, and revise the following:

a. The basic principles of concealment.

b. Indications which disclose the presence of an unseen enemy.

c. The points to be observed when executing any undetected movement.

d. The indication and recognition of targets.

Approach

152. *Explain the aim and continue.* Moving targets are generally much easier to detect than stationary targets, especially if they are moving over open ground. Important points to note are:

a. A target moving across the front is the easiest to detect but the hardest to hit.

b. A target moving straight towards or away from the observer is the hardest to detect but the easiest to hit.

c. A well trained soldier keeps his opponents constantly off balance by varying the length and direction of his rushes, varying the time between rushes, crawling away from the place where he went to ground, and therefore reappearing at a different aiming point.

153. To engage a detected moving target:

a. If it is possible to get a correct aim picture while the target is moving, fire at it.

b. When a moving target drops from sight select an aiming point or reference point to engage it, indicate it, or remember where it is.

c. The method used to engage the target depends upon the situation and conditions, but basically the following applies:

(1) If the target is behind cover, wait until he reappears before firing. Fire as he gets up and before he moves off.

(2) If the target is only concealed, search the aiming point and the area around it to detect if the enemy attempts to crawl away. Then fire through the concealment.

154. Achieve the first student performance objective by questions from and to the squad.

Detecting Moving Targets

155. Achieve the second student performance objective by conducting the trials shown in Appendix 3 to Annex B, Sample Master Trial Sheet, Lesson 6.

156. In trials 3 to 5 the targets are to move toward the observers. Suitable questions and comments for each trial are as given in the following paragraphs.

157. *Trial No.* 1. *Position with a good aiming point*:

a. Question the squad as to how the location of this target can be remembered.

b. Nominate a method of indication and have a member of the squad indicate the target. Have the remainder comment on the indication.

158. *Trial No.* 2. *Position with a poor aiming point*:

a. As for trial No. 1, and

b. Question the squad as to why this target was harder to indicate than the previous trial.

159. *Trial* 3. *Easy movement. Explain.* There is a targetman standing in full view at 200 metres. When he disappears, select an aiming point and aim at it using the aiming device.

160. Order *"TARGET DISAPPEAR"*, then conduct the following questions and comments:

a. Ask how many would fire at the point where the target disappeared? How many would wait and fire as the target got up, Either answer could be correct according to the position selected.

b. What action can be taken to deal with the enemy if he should move away from where he went to cover? The answer should be to observe the area around the aiming point for indications of where the enemy might be concealed. Fire at any spot disclosed by some indication.

c. Explain that when the target reappears he will make several rushes. Each time he disappears, select an aiming or reference point and aim. Estimate if there would be sufficient time to aim and fire at the target while he is moving:

(1) Criticize the selection of aiming points.

(2) Question the squad as to how this target would be engaged.

(3) Nominate a method of indication and have a member of the squad indicate the target. Have

the remainder comment on the indication.

(4) Point out the carelessness of this target because he always reappeared in the same place where he had gone to ground, thus making an easy target when he got up.

161. *Trial* 4. *Reappearance at the aiming point:*

a. Explain that this trial will be similar to trial No. 3 but more difficult because the observers will not know where the target will start from, or other factors.

b. Order the trial to begin. Question the squad as to why the target would have been harder to hit than the previous one. The answers are:

(1) There were no clear aiming points where the target disappeared.

(2) The length of the rushes varied.

c. Comment on the above factors and emphasize that they must be applied whenever it is necessary to advance in the face of hostile enemy fire.

162. *Trial* 5. *Targets disappearing and reappearing at different points, which are all poor aiming points:*

a. Have the squad attempt to aim at the target or aiming mark.

b. Nominate a member of the squad to indicate the final location of the target, or the position where he considers the target is located.

c. Point out how difficult it is to aim at a target that is reasonably well trained.

163. *Trials* 6 *and* 7. *Movement across the observer's front. Explain*: When a target moves accross the line of sight, it is generally easier to detect but harder to hit. The distance moved is usually short, if the target is well trained, and this decreases the chances of obtaining a hit:

a. Conduct the trials and point out how easy it would have been to hit the target which got up in the place where he went to cover.

b. Emphasize how important it is to fire into the concealment before the enemy has a chance to crawl away.

164. *Trial* 8. *Single long rush*:

a. Commence the trial and comment, after the rounds are fired, that the target does not seem to be going to reappear and ask the squad what they would do.

b. As the target is behind cover, it would be best to wait for the target to reappear. This could be without results and this is a good example of what to expect in battle. The soldier must have patience.

165. *Trials* 9 *and* 10, *Varied movement.* Conduct the trial and ask the squad how many noticed each of the following points:

a. Disappearing at good aiming points.

b. Disappeared at a good aiming point, but reappeared elsewhere.

c. Disappearance and reappearance at poor aiming points.

d. Lateral movement.

e. Varying lengths of rush.

166 to 167. Reserved.

Conclusion

168. Questions from and to the squad.

169. Sum up the main points which are:

a. How and when to engage a detected moving target.

b. The detection of single moving targets which:

(1) Vary their direction of movement.

(2) Vary their length of rush.

(3) Vary the points at which they reappear after disappearing.

(4) Disappear behind cover.

LESSON 7 — DETECTION OF MULTIPLE MOVING TARGETS

Aim

170. To teach and exercise the class in the detection of multiple moving targets.

Student Performance Objectives

171. At the completion of this lesson, students must be able to:

a. Explain the factors which make the remembering of target locations difficult.

b. Explain how to engage targets when there is a choice of more than one.

c. Detect multiple moving targets which vary their direction, length of rush, spacing interval, and disappear at good and poor aiming points.

Stores

172. **a.** Aiming devices.

b. Master trial sheets.

c. Public address system.

d. Camouflage material.

e. 50 Rounds of 7.62mm Blank.

Period

173. One and one half hours — lesson.

Notes

174. The staff required for the successful conduct of this lesson, and their various duties, are as follows:

a. The Principal Instructor (PI):

(1) Rehearsal of assistants and fatigue men.

(2) Conduct of the lesson.

b. Two Assistant Instructors (AI):

(1) Controlling observers.

(2) Assist in scoring.

(3) Assist the PI as required.

c. At least four fatigue men, dressed in battle order, are to occupy target locations and act as hostile targets, executing actions similar to those detailed in the Sample Master Trial Sheet. See Appendix 4 to Annex B.

Preliminaries

175. Carry out safety precautions on all weapons to be used. Organize an arc of observation, including reference points, and revise the following:

a. The indication and recognition of targets.

b. How and when to engage a detected moving target.

Approach

176. *Explain the aim and continue.* One of the most important skills required of a battlefield soldier is being able to remember the location of more than one target so that the maximum number of targets can be effectively engaged with fire.

Remembering Target Locations

177. Multiple moving targets are comparatively easy to detect, but remembering their locations is usually difficult due to the following factors:

178. *Co-ordinated Movement.*

a. When all targets appear and disappear at the same time, it is difficult to remember the location of more than one or two.

b. Demonstrate this by having the four targetmen make a co-ordinated three second rush to poor aiming points.

179. *Length of Exposure.*

a. Moving targets are fleeting and are rarely exposed for more than a few seconds. Targets exposed for a longer period do not usually disappear simultaneously and therefore their locations can be noted and remembered as they disappear.

b. Demonstrate this by having the four targetmen make a haphazard six second rush to poor aiming points.

c. When targets are exposed only for a very short time, the observer should try and remember the general areas where they went to ground. He should be able to remember the exact location of at least one of the targets.

d. Demonstrate this by having the four targetmen make a two second rush to poor aiming points.

180. *Target Spacing.*

a. When targets are bunched, remembering their location is made comparatively easy. Targets that are spaced well apart are much harder to detect and the observer again must concentrate on remembering the general areas where the targets went to ground. He should be able to remember the exact location of at least one of the targets.

b. Demonstrate this by having the four targetmen make a short rush, bunched together, and to poor aiming points. This is to be followed by a second short rush, well spaced out, and to poor aiming points.

181. Good or poor aiming points, where the targets choose to go to ground, will greatly influence the ability of the observer to remember target locations.

182. Achieve the first student performance objective by questions from and to the class.

Engaging Multiple Moving Targets

183. *Explain.* Aiming at and engaging multiple moving targets is no different than engaging a single moving target, because they are dealt with one at a time.

184. When there is a choice of two targets, one at a good and one at a poor aiming point, engage the difficult one first. This will make it much easier to remember the location of the second target, due to the good aiming point.

185. Where there are a number of targets dispersed over an arc, and all their locations are equally difficult to remember, engage the closest target first.

186. Achieve the second student performance objective by questions from and to the class.

Detecting Multiple Moving Targets

187. Achieve the third student performance objective by conducting the trials shown in Appendix 4 to Annex B, Sample Master Trial Sheet, Lesson 7.

188. Each observer is to have an aiming device with four aiming bars. When targets are detected, observers are to point an aiming bar at each target location that can be remembered. Assistant Instructors check the aims for correct target location.

189. The Principal Instructor is to make suitable comments during the trials, as shown in the Instructor's Notes of the Sample Master Trials Sheet.

190 to 191. Reserved.

Conclusion

192. Questions from and to the class.

193. Sum up the main points, which are:

a. The factors which make the remembering of targets difficult.

b. Engaging targets when there is a choice of more than one.

c. Detecting multiple moving targets.

LESSON 8 — DETECTION OF TARGETS BY SOUND

Aim

194. To teach and exercise the class in the detection of targets by the sound of small arms fire.

Student Performance Objectives

195. At the completion of this lesson, students must be able to:

a. Determine the direction and range to a weapon by information gained from the *"crack* and *"thump"*.

b. Detect targets by the sound of small arms fire.

Stores

196. **a.** AAF C75s)
b. SLRs)
c. ARs) And a suitable quantity of ammunition for each.
d. M16s)
e. F1s)
f. GPMGs and tripods.)
g. Red flags.
h. First aid kit.
i. Camouflage material.
j. Weapon cleaning stores.

Period

197. Two hours — lesson.

Notes

198. This lesson is best conducted on a field firing range using live ammunition.

199. Students must be either behind bulletproof cover or outside the danger area, for the particular weapon being fired, as applied in, *"IT Vol* 3, *Pamphlet No.* 33, *Range Construction Regulations and Safety Precautions, (All Arms)*, 1967".

200. The *"crack and thump"* demonstration requires careful rehearsal. Firers should be experienced NCOs who:

a. Are competent in the use of the weapon they are to fire.

b. Have correctly zeroed weapons to fire.

c. Have definite targets to aim and shoot at.

d. Have a tripod to fire a GPMG from.

201. As wide a variety of small arms weapons as possible should be fired, at ranges up to 600 metres.

Preliminaries

202. Prepare the range, check the safety angles, and thoroughly brief all demonstrators and safety personnel.

203. Move the students into position for the conduct of the lesson, organize an arc, and revise them in the indication and recognition of targets.

Approach

204. *Explain the aim and continue.* Targets have so far been detected because of some violation of the basic principles of concealment, or because of some indication such as smoke, dust, flash, etc. The sound of firing has only been used, so far, as an alert, and the precise location of an enemy has been determined by flash or smoke, etc. However, against a well trained and cunning enemy, the sound of firing may be the only indication to his location.

Information Gained from *"Crack"* and *"Thump"*

205. When a shot passes nearby, the first thing heard is the *"crack"* of the bullet, and then the *"thump"* of the weapon that fired it. The sounds are heard in that order because the bullet travels faster than the speed of sound.

206. *Demonstrate* this by having all demonstrators fire for 10 seconds.

207. *Explain.* By ignoring the *"crack"* and concentrating on the *"thump"*, it is possible to determine the direction to the firing weapon.

208. *Demonstrate* this by having weapons fire individually and students determining the direction of the weapon by sound only.

209. *Explain.* The interval between the *"crack"* and the *"thump"* will give some indication as to the range to the firing weapon. The farther away the weapon, the longer the interval between *"crack"* and *"thump"*.

210. Have all demonstrators fire in turn and have the students estimate the range according to the interval between *"crack"* and *"thump"*. The instructor is to give the correct range in each case.

211. Repeat the procedure in 210 until all observers are estimating the correct range consistently. Vary the sequence in which the demonstrators fire.

212. Achieve the first student performance objective by firing weapons individually and having students determine the direction and range to the firing weapon, by sound.

Target Detection by Sound

213. *Explain.* The sound of firing may be used in conjunction with a search of likely enemy fire positions, to locate hostile targets.

214. A well trained rifleman selects likely enemy fire positions, within his arc of responsibility, as soon as he occupies a position. When time permits, a range card should be constructed, showing these dangerous locations and the ranges to them.

215. Have each observer construct a range card showing likely enemy positions and reference points.

216. *Explain and demonstrate.* The detection of targets by sound as follows:

a. Listen to the interval between the *"crack"* and *"thump"* and try to determine the range to the weapon.

b. Listen to the *"thump"* and judge the direction from which it came.

c. Look in the estimated direction, and at the estimated range, for any target indications such as smoke or dust, etc.

d. Search likely enemy positions in that area and watch for some indication of the presence of a hostile target.

217. Achieve the second student performance objective by practising the class in detecting and indicating targets by sound and indicating them.

218 to 219. Reserved.

Conclusion

220. Questions from and to the class.

221. Sum up the main points, which are:
a. Information given by the *"crack"* and *"thump"*.
b. Target detection by sound.

222. Conduct a safety check of all weapons. Recondition the range and stores.

LESSON 9 — FIRE CONTROL ORDERS

Aim

223. To teach and exercise the squad in giving, and reacting to given, fire orders.

Student Performance Objectives

224. At the completion of this lesson, students must be able to:

a. Explain the preliminary factors and rules to be considered prior to giving a fire order.

b. Explain the unvarying sequence of a fire control order.

c. Give, and react to a given, fire control order.

Stores

225. **a.** Aiming devices.

b. GPMGs.

c. Drill belts.

Period

226. Four 40 minute periods — lesson.

Notes

227. Choose the ground carefully; select realistic targets, that men might have to engage in battle, and at realistic ranges.

228. The squad are to be dressed in battle order and carry rifles.

Preliminaries

229. Carry out safety precautions, organize an arc of fire and revise the indication and recognition of targets.

Approach

230. *Explain the aim and continue.* Unless fire unit commanders can ensure that the fire power under their control is applied effectively in battle, individual skill in weapon handling will be largely wasted. It is thus obvious that all officers and NCOs must be able to give clear and accurate fire control orders. At the same time it must also be remembered that in battle anyone may find himself in charge of a fire unit, and therefore all ranks should be competent in fire control so that they can take over should their leaders become casualties. They must, moreover, understand the reasons behind fire control orders if they are to carry them out intelligently.

231. No fire control order can be effective unless the target is clearly indicated, and can be easily recognized by the men of the fire unit.

Preliminary Factors

232. There are certain factors which must be considered before giving a fire control order. The fire controller should ask himself:

a. Does the range, visibility and vulnerability of the target justify fire at all? Would it be better to wait and

get a more vulnerable target or more complete surprise?

b. What is the best weapon or weapons to use? Although the MG is the main weapon of the section, the target may be more suitable for the fire of the riflemen only, or possibly for a combination of both weapons.

c. Should the fire be rapid or at the normal rate? Rapid rate is justified only on the comparatively few occasions when it allows the maximum effect to be gained from surprise, when an especially vulnerable target presents itself, or to cover movement in the final stages of an assault.

Rules

233. Having decided to open fire, the next problem is how to give the order. The four main rules which must be followed are:

a. The order should be given clearly, calmly and concisely.

b. It should be given loudly, so as to be heard above the noise of battle.

c. It must be given as an order, and obeyed as such.

d. It should be given with adequate pauses, so that those being addressed may have time to take the correct action. For example, there must be time for firers to make *"READY"* after the range is ordered.

234. Achieve the first student performance by questions from and to the squad.

Sequence

235. *Explain.* To avoid errors and omissions, and so that everyone knows what to expect next, fire orders must always be given in the following unvarying sequence, which can be remembered by the keyword GRIT:

a. G — For the group to react to the fire order, eg, *"SECTION" — "GUN GROUP" — "RIFLE GROUP"*.

b. R — For the setting of sights where necessary, the making *"READY"* of weapons, and the distance at which to look for the target.

c. I — For the indication of the target.

d. T — For the type and rate of fire to be delivered. Examples are:

(1) *"FIRE"* — Fire at once at the normal rate.

(2) *"RAPID FIRE"* — Fire at once at the rapid rate.

(3) *"WATCH AND SHOOT"* — Fire individually when targets appear in the indicated location.

(4) *"AWAIT MY ORDER"* — Be prepared to fire but do not commence until the order to fire is given.

(5) *"GO ON"* — Continue firing at the normal rate, unless the order *"RAPID GO ON"* is given.

236. Achieve the second student performance objective by questions from and to the squad.

Types of Fire Control Orders

237. *Explain and demonstrate each of the following types of fire orders.*

238. *Full fire control orders.* These are given where the target is not obvious and sufficient time is available to issue a full fire order. Examples are:

a. *"GUN GROUP — FOUR HUNDRED — BARN — LEFT NINE O'CLOCK ABOUT THIRTY MILS — ENEMY GUN GROUP IN BUSHES — RAPID FIRE".*

b. *"SECTION — TWO FIFTY — HALF LEFT — EARTHWORKS NEAR GAP IN TREELINE—FIRE".*

239. *Brief fire control orders.* These are given when there is little time and the target is obvious. Examples are:

a. *"READY — QUARTER LEFT — RAPID FIRE".*

b. *"READY — BRIDGE — FIRE".*

240. *Delayed fire control orders.* These are used when the fire controller can anticipate what our own or the enemy troops are going to do. The fire unit gets ready to fire but waits till the right moment before opening fire. Examples are:

a. *"SECTION — THREE HUNDRED — ROCKS — RIGHT FIVE O'CLOCK — ENEMY IN HEDGEROW — TWO PLATOON IS MOVING THROUGH THE COPSE FROM OUR RIGHT. WE ARE GOING TO COVER THEIR ADVANCE WHEN THEY GET TO THE OPEN — RAPID — AWAIT MY ORDER".* When two platoon is about to come into the open — *"FIRE".*

b. *"SECTION — TWO FIFTY — QUARTER RIGHT — SMALL WOOD — WHEN ENEMY APPEAR THIS SIDE — RAPID — AWAIT MY ORDER".* Then when the enemy are in a suitable position — *"FIRE".*

241. *Individual fire control orders.* These are given when targets are exposing themselves for very short periods and therefore time does not permit a fire order to be given. Examples are:

a. *"RIFLE GROUP — TWO HUNDRED — SLIGHTLY LEFT — FARM BUILDINGS — ENEMY IN THAT AREA — WATCH AND SHOOT".*

b. *"SECTION — THREE HUNDRED — TREE — RIGHT THREE O'CLOCK, ABOUT ONE HUNDRED MILS — ENEMY IN COPSE — WATCH AND SHOOT".*

242. Orders which may be given during firing are:

a. *"STOP".* Stop firing but continue to observe.

b. *"MAKE SAFE".* Unload and then load. Usually given when preparing to advance.

c. *"GO ON".* Resume firing at the normal rate.

d. *"RAPID GO ON".* Resume firing at the rapid rate.

243. Have the weapons loaded, get the squad into a section position, each man occupying a good fire position.

244. Achieve the third student performance objective by practising the squad as follows:

a. Select one man to give the fire order. Indicate the target only to him, using an aiming device.

b. Give the fire controller a brief tactical description of the target so he can select the correct position of the fire unit to use and fire at a suitable rate.

c. Have the fire order issued and complied with, then criticize the following points, where necessary:

(1) The fire order. Was it:
- (a) Clear?
- (b) Concise?
- (c) Given loudly?
- (d) Given as an order?
- (e) Given with the necessary pauses?
- (f) Employing the correct part of the fire unit?

(2) The fire unit. Did they:
(a) Recognize the target?
(b) React to the fire order correctly?
(c) Employ the correct rate of fire?

245. If there is any doubt about the target engaged by the section, have one or two members indicate the target, using the aiming devices.

246 to 248. Reserved.

Conclusion

249. Questions from and to the squad.

250. Sum up the main points, which are:
a. The preliminary factors and rules to be considered.
b. The sequence of a fire control order.
c. Giving, and reacting to given fire control orders.

LESSON 10 — CROSSING OBSTACLES

Aim

251. To teach and exercise the squad in the methods to be employed when crossing obstacles.

Student Performance Objectives

252. At the completion of this lesson, students must be able to:
a. Cross various types of barbed wire entanglements.
b. Cross gates, wooden fences, and roads.
c. Cross ditches, entrenchments, thin ice, and walls.
d. Explain the factors to be considered before crossing danger areas.

Stores

253. **a.** Camouflage materials.
b. GPMGs with slings and carryalls.
c. Wire cutters.
d. Cleaning rag.

Period

254. One 40 minute period — lesson.

Notes

255. The students are to be dressed in battle order, carry rifles, and be suitably camouflaged. Clothing and equip-

ment used should be such that the students are not tentative about crawling through mud, etc, in it, or afraid of geting it torn on barbed wire.

256. Prepare a course with various types of obstacles on it. The obstacles should be such that they can be negotiated without difficulty or great effort, because the aim is to teach and exercise obstacle crossing rather than build confidence in physical strength and endurance.

Preliminaries

257. Carry out safety precautions on all weapons and revise the squad in individual daylight movement.

Approach

258. *Explain the aim and continue.* Avoid obstacles whenever possible because they are usually covered by enemy fire. When there is no alternative but to cross the obstacle, it should be done quickly so as to present a vulnerable target for the least length of time.

Barbed Wire Obstacles

259. *Explain and, where necessary, demonstrate.* Most armies of the world use barbed wire obstacles, such as double apron, concertinas or low wire entanglement. These obstacles may be booby trapped or have noise making devices attached. General points to note, for crossing wire obstacles, are as follows:

a. Crawl underneath where possible. It may be a practical solution for the first man to prop up the wire with sticks to assist those who are following.

b. Loose wire or concertina can be crossed by one man placing himself prone on the wire and those following to walk over his body.

c. It may be necessary to cross over a low wire entanglement by stepping between the strands.

d. When it is necessary to cut through wire, cut only the lower strands and leave the top wire in place. This makes it harder for the enemy to discover the gap. Do not cut a taut wire until it is investigated for booby traps. When alone, cut the wire near a picket. Prevent the loose ends from flying back, for the sound may attract the enemy's attention. Wrap cloth around the wire and hold it with one hand; place the cutters between the hand and the picket. Carefully roll back the loose strand to

clear a path. When someone else is near, have him hold the wire with both hands. Use cloth and cut the wire in the same way, cutting between the assistant's hands. Quietly bend the loose ends back.

260. Achieve the first student performance objective by practising the squad in crossing barbed wire entanglements of various types.

Gates and Wooden Fences

261. *Explain and demonstrate.* The best way to negotiate these is to crawl under them. Where this is not possible, it may be possible to cross them quickly by vaulting over them.

Roads

262. In crossing a road, select a place which provides the most cover and concealment, and a covered position to go to. Look for a large culvert, a low spot in the road, or a bend in the road. Cross as fast as is possible, go to cover and observe.

263. Achieve the second student performance objective by practising the squad in crossing gates, wooden fences, and roads.

Ditches and Entrenchments

264. *Explain and demonstrate.* Where the route is blocked by wide ditches and entrenchments. Climb quietly and carefully down one side and up the other.

265. If the ditch or trench is narrow it may be easier to run and jump across it. To cross obstacles by this method:

a. Approach the obstacle cautiously and study it from a position of observation.

b. Ensure that there is a firm quiet footing on both sides of the obstacle.

c. Select a position to take cover in on the other side of the obstacle.

d. Jump up quickly, run fast and jump the obstacle, go to ground, crawl into the chosen position and observe.

Thin Ice

266. *Explain.* If it is not possible to avoid crossing thin ice, it may be possible to cross it by sliding along on the stomach, or on a board, to spread the weight over a larger area.

Walls

267. *Explain and demonstrate.* Crossing over a wall or similar obstacle is a dangerous practice which silhouettes the person

crossing the obstacle and thus makes him extremely vulnerable. Where there is no alternative but to cross a wall, keep the body as flat as possible and roll across the top of it as quickly as possible. Where the wall is high, one or more members can position themselves at the base of the wall and assist others to reach the top, in any way possible.

268. Achieve the third student performance objective by squad practice.

Danger Areas

269. *Explain.* Any area where manoeuvrability and observation will be restricted, or there exists a likelihood of being exposed to enemy observation or fire, is a potential danger area. In making a decision to cross these areas, the following points should be considered, and can be remembered by the key word NOSE:

a. N — Nearness to the enemy. For example, a danger area close to the enemy should be considered differently from an area farther away.

b. O — Obstacles. These include minefields, ditches, deep streams, barbed wire, etc.

c. S — Security. These measures should include a thorough reconnaissance of both sides of a danger area, as far as is practical, and protection while crossing.

d. E — Exposure. The minimum amount of exposure to enemy observation or fire that can be expected while crossing the danger area.

270. Achieve the fourth student performance objective by questions from and to the class.

271 to 273. Reserved.

Conclusion

274. Questions from and to the squad.

275. Sum up the main points, which are:

a. Crossing:

(1) Barbed wire obstacles.
(2) Gates and wooden fences.
(3) Ditches and entrenchments.
(4) Thin ice.
(5) Walls.

b. Danger areas.

LESSON 11 — INTRODUCTION TO NIGHT WORK

Aim

276. To convince the class that night training is important and to show them how their eyes function in the dark.

Student Performance Objectives

277. At the completion of this lecture, students must be able to:

a. Explain the factors discovered about night vision.

b. Explain the construction and operation of the human eye.

c. Explain the principles of night vision.

d. Apply the principles of night vision.

e. Explain the Auto-kinetic illusion.

Stores

278. **a.** Tape recorder.

b. Panorama box and screen.

c. Two torches showing only a pinpoint of light.

d. A camera flashlight and bulb.

e. Red lights.

f. A chart of figures 8, 9 and 10.

g. A chart of the colour spectrum.

h. A chart of the principles of night vision.

Period

279. A one hour period — lecture.

Notes

280. Test all apparatus. Determine the correct rheostat setting of the panorama box. See Annex C.

281. Ensure the room can be really well blacked out and either:

a. Memorize the taped narrative, See Annex D, for presentation in the dark, or;

b. Record it on magnetic tape and play it back, as required, in the dark.

282. Seat the class facing the screen.

Approach

283. *Explain.* The Army has many devices which were designed to either locate or identify targets at night. Whether in the field of Infra-red or Radar, these devices do exist and are available. However, even the simplest of these is an electronic piece of equipment, and therefore expensive; very often it is heavy or bulky, and in most cases it requires a specially trained operator. It is for these reasons that the individual soldier has found himself with nothing but his own two eyes to detect targets at night. He soon learns that the darkness can be his friend or his enemy. (Lights Out.).

284. THIS IS THE WORLD OF THE UNTRAINED SOLDIER AT NIGHT. JUST LIKE A BLIND MAN, HE SEES NO COLOUR, NO SHAPE, NO CONTRAST. TO HIM, EVERYTHING IS DARKNESS. (Lights On).

Scope

285. The introduction to night work is designed to focus attention on target detection; locating a target during the hours of darkness or under periods of low illumination. Target detection is one of the two major difficulties the untrained soldier experiences when he first attempts to fire a weapon at night. The other difficulty is weapon alignment — aligning the weapon with the target in order to place effective fire on it. Anyone who has fired a weapon at night has probably experienced these difficulties. A knowledge of the construction and operation of the human eye is necessary to employ the principles of night vision so as to be able to see during periods of low illumination.

Background and Research

286. The problems of seeing in the dark are not new. During the early stages of World War 2, reports filtered back from the South Pacific that gave cause to be concerned. The soldier felt that he was fighting an invincible enemy because of the enemy's apparent superhuman ability to move and fight at night. It was found, however, that this was not due to an inherent or built-in ability of the enemy. It was the result of extensive training. Again in Korea, the enemy advocated, and was successful in, operating at night. Experiences such as these dictated research, which has shown several interesting findings:

a. One per cent of males are blind at night; they are incapable of seeing or see very little.

b. No one race of people has an inherent ability to see better at night than another. Why then, were difficulties

encountered in the South Pacific and again in Korea, against a highly experienced and much too often, a very successful night fighter. There were two reasons:

(1) Emphasis on night operations by the enemy.

(2) The soldier, up to this time, never had to use his eyes at night. In a scientifically advanced country, when the sun goes down, first thing to do is reach for a light switch. Homes, buildings, streets and cars are all brightly lit. In some places of the world when the sun goes down it's just plain dark. Little children learn to see at night. They don't know the principles of night vision; with them it is an automatic action. Soldiers of more advanced nations must be made aware of the ways of getting the maximum use of their eyes at night.

c. There are, in reality, day and night eyes. There is no correlation between the two. The person with good day vision may be blind at night, while the person who wears glasses during the day may have the ability to see better at night than some men with good day vision.

287. Achieve the first student performance objective by questions from and to the class.

Construction and Operation of the Human Eye

288. *Explain and demonstrate, using a chart of Figure* 8. To better understand the eyes and how they function, compare the eye to a simple camera. The chart shows a vertical cross-section of a simple camera and the human eye. Compare the two, beginning with the camera. Light enters the camera through the aperture. The amount of light that enters is controlled by the diaphragm. The light is focused by the lens on the sensitive film. The developed film gives a lasting picture of what the camera has seen. IN THE EYE, THE IMAGE IS NOT LASTING, BUT IS INSTANTANEOUS. Light enters the eye through the pupil. The amount of light is controlled by the iris. The light passes through the lens and is focused on a sensitive area called the retina. From here the optic nerve transmits electrical impulses to the brain.

289. In actuality, then, the brain sees rather than the eyes. The retina is composed of two sets of cells, named for their shape. They are rod cells and cone cells. The cone cells are used in daylight, they see colour, sharp contrast and shape.

CONSTRUCTION OF THE HUMAN EYE

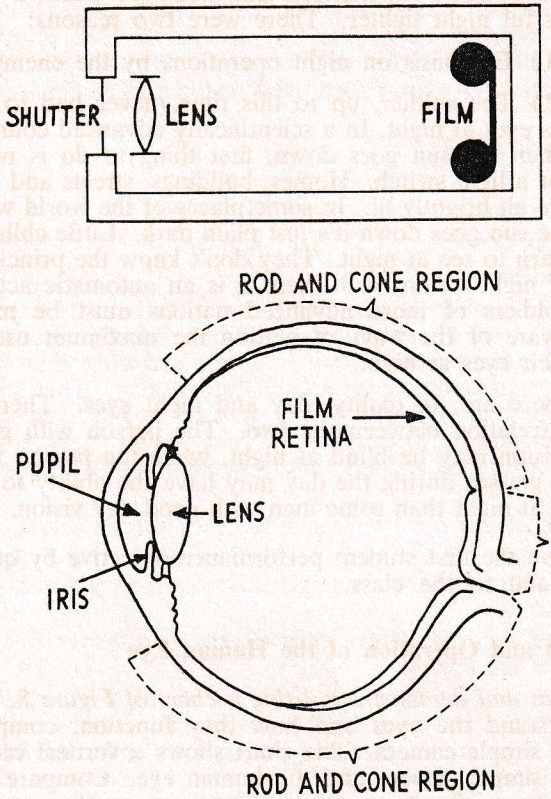


Figure 8

The cone cells are found predominantly behind the pupil in an area called the cone region. There are approximately seven million cone cells in the human eye.

290. The rod cells are the night eyes. These cells are located around the cone region on the outer portion of the retina. There are a few rod cells in the cone region, but they are of an insufficient number to allow night vision for any period of time. There are 130 million rod cells in the eye. They only see black and white and shades of grey. Therefore, in order to see effectively at night, the rod area of the eye must be used.

291. Achieve the second student performance by questions from and to the class.

Principles of Night Vision

292. *Explain* that a knowledge of the anatomy of the human eye is not sufficient to enable an observer to see at night. There are certain principles he must apply to make maximum use of his eyes. They are called the Principles of Night Vision, which are:

a. Dark adaptation.

b. Off-centre vision.

c. Scanning.

d. Confidence.

Dark Adaptation

293. Dark adaptation is allowing the eyes to become capable of seeing under low illumination conditions. Most people have wondered what happened to their ability to see when they have gone into a matinee movie on a bright sunny day. They probably not only had difficulty trying to find a seat, but were completely unsure of themselves. Three things were taking place in the eyes that caused these few minutes of blindness. They were:

a. All of the cone cells are blind in the darkness.

b. A chemical compound called visual purple is being manufactured in the eye to sensitize the rod cells, enabling them to see.

c. The pupil of the eye must expand to allow more light to enter the eye.

294. The amount of time it takes to become dark adapted depends upon the individual's physical makeup. Some people become partially dark adapted in from six to 10 minutes; others take much longer. However, to become 98 per cent dark adapted, it takes the average individual approximately 30 minutes.

295. There are several different ways of becoming dark adapted. First of all, by simply sitting in a completely darkened area for 30 minutes an individual may become dark adapted. However, there are many individuals who must work under lighter conditions, such as CPs, and then are called upon to go into the darkness to perform certain tasks. These individuals can also become dark adapted by the use of red goggles or red lights. Red lights and red goggles filter all light except red light, which does not destroy the visual purple that is being built up in the eye. However, before going out into the dark the individual should spend 10 minutes in a completely darkened area in order to allow the pupils of his eyes to completely dilate.

Off-centre Vision

296. *Explain and where necessary demonstrate.* Off-centre vision is looking 100 to 180 mils away from an object while still concentrating on it. (NOTE. PICK AN OBJECT THAT THE ENTIRE CLASS CAN SEE, SUCH AS THE LECTERN. HAVE THEM STARE AT THIS OBJECT WHILE YOU MOVE AWAY FROM IT. THEN WHILE THEY ARE STARING AT THE OBJECT, HAVE THEM CONCENTRATE THEIR ATTENTION ON YOURSELF. WAVE YOUR HAND OR ARMS TO SHOW THE STUDENT THAT IT IS POSSIBLE TO SEE IN THIS MANNER.) This is simply looking out of the corners of the eyes, perifical vision, or as it is called, Off-centre vision. See Figure 9.

OFF-CENTRE VISION

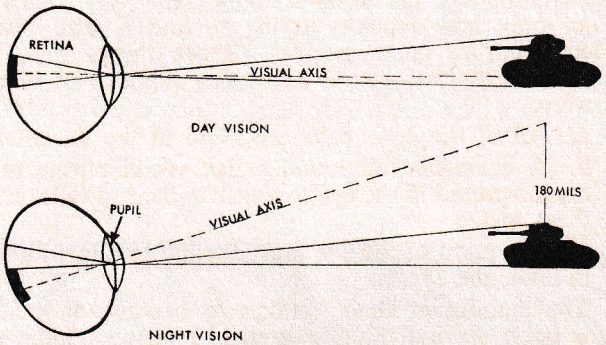


Figure 9

297. Off-centre Vision is used to put the rod region of the eyes into play instead of using the blind cone cell area directly behind the lens.

298. A situation to support this is as follows:

a. Imagine that you are in the jungle at night and you detect an enemy soldier approaching your position! You see him momentarily, but he quickly disappears. Why?

b. When first looking directly at the enemy soldier approaching, he is reflected on the cone region of the eye. As stated earlier, there are a few rod cells in the cone region, but not of sufficient number to enable an observer to see more than momentarily. Therefore, the object disappeared because there were no more rod cells

to enable it to be seen. By using Off-centre Vision, ie, looking 100 to 180 mils away from the object while concentrating on the object, the image will be reflected on the rod region of the eye, enabling it to be kept in view. The observer may look either to the left, to the right, below or above the object.

Scanning

299. *Explain.* Scanning is the short, abrupt movement of the eye over or around an area of observation or an object you are keeping in view. The reason that an observer must apply scanning is the visual purple that sensitizes the rod cells will bleach out after being exposed from 4 to 10 seconds. When the one group of rod cells are no longer sensitive to night lighted objects, another group of rod cells must be brought into use by shifting the visual axis. Therefore, every four to 10 seconds an observer must shift his visual axis. Another reason for scanning is that the rod cells are sensitive to motion, but are not capable of seeing while IN motion. Therefore, an observer must use speed when shifting to the new group of rod cells in order to detect movement. See Figure 10.

SCANNING

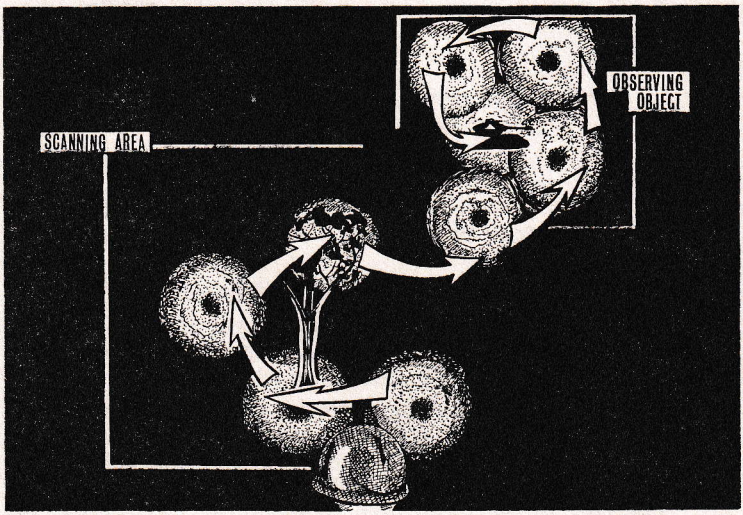


Figure 10

300. It is important to note that this method differs from daytime scanning. In daylight an observer searches by moving his eyes from left to right in overlapping parallel bands from near to far. If he used this method at night he would tend to be using the same set of rod cells constantly and would have the eyes in movement most of the time. Therefore, he would see nothing. Scanning is to be used in conjunction with Off-centre Vision in order to gain the maximum use of the eyes at night.

Confidence

301. *Explain.* In order to gain confidence in the ability to see under low levels of illumination the principles just discussed are to be applied. The observer must then believe what the eyes tell him they see. Because the rod cells do not work in the same manner as the cone cells, objects seen at night tend to be fuzzy and hazy around their extremities and are not clear-cut as seen in the day time. An observer must, through practice, learn to recognize objects at night and know how they differ from their day time appearance. This night familiarity can be obtained by integrating into night work the principles of night vision, and by constant practice. Having become familiar with the techniques of seeing at night, the ability and the confidence to make night operations successful will quickly follow.

302. Achieve the third student performance objective by questions from and to the class.

Practical Night Vision

303. To achieve the fourth student performance objective, turn out the lights, play the taped narrative, Annex D, as and when required, and conduct the small experiments contained therein. Remind the class to keep noise to a minimum during the experiments and that all response to questions is to be by the whole group.

304. Turn on the lights and explain that this has demonstrated that the dark adaptation of each eye is independent of the other. This has an important application. If, after having the eyes dark adapted, it should become necessary to go from the darkness into a lighted place, such as CP, cover one eye. To go out into the darkness from the CP, it will be found that it is possible to see with the eye that was covered about as well as before entering the lighted CP.

Auto-kinetic Illusion

305. *Explain and demonstrate as follows*:

a. In my hand, I have an ordinary service torch, which

has been modified slightly. A sheet of heavy paper has been inserted in front of the glass. A small hole a little larger than a pin-hole has been punched in the paper. I am going to turn off the lights and turn on this torch, and I want you to tell me how you see it move. Tell me in which direction the light is moving. (NOTE: TURN OFF LIGHTS. THEN PLACE TORCH IN A STATIONARY POSITION BEFORE TURNING IT ON. THEN MOVE AWAY FROM THE TORCH AND HAVE CLASS MAKE COMMENTS ON ITS APPARENT MOVEMENT. LIGHTS ON.)

b. You see the light was not moving at all. Now to prove that I did not talk you into thinking that the light moved, I will stand right here and have the lights put out once again. The same phenomena will recur despite the fact that you know the light is stationary. (NOTE: TURN OFF LIGHTS AND TURN ON TORCH. AFTER ONE MINUTE TURN LIGHTS ON.) Now, this time I am going to place another torch on the other side of the first torch and turn the lights off. Again, stare at the lights and see if they appear to move. (NOTE: TURN LIGHTS OFF FOR ABOUT ONE MINUTE.) No, the two lights did not appear to move. This phenomena is known as the Auto-kinetic Illusion.

306. The single pinpoint of light in the darkness appears to move, usually up and to the right or down and to the left. This occurs because the eye has no second point to focus upon, and as a result the middle ear cannot maintain its equilibrium, resulting in this illusion.

307. This illusion of a single pin-point of light is now shown as a parlor trick. It has several important applications. Twin tail lights are not placed on vehicles for sales appeal. Driving in a blackout with only one blackout light, the driver following another vehicle would experience this illusion of light floating up and to the right or down and to the left. When he turns to follow this light, he suddenly finds himself wrapped around a tree or upset in a ditch.

308. Another example. It is known that troops in a jungle position have seen a break in the foliage and a single star beyond. Unless they have this illusion explained to them in training, they will stare at this star, or light source, and soon it will appear to move. They open fire, and a fire fight begins all because of a star.

309. Achieve the fifth student performance objective by questions from and to the class.

310 to 312. Reserved.

Conclusion

313. Questions from and to the class.

314. *Summarize as follows.* At the beginning of the period it was stated that quite a bit of trouble has been experienced in the South Pacific and again in Korea. What did the enemy have that made him so effective? He had nothing other than what has been learned in this lesson.

Principles of Night Vision

315. It was found that it is necessary to become partially dark adapted before being able to see in the darkness. After becoming dark adapted it was found necessary to concentrate from 100 to 180 mils away from the blind cone cells. It was also found necessary to shift to another set of rod cells every four to 10 seconds because of the tendency of the visual purple to temporarily bleach out. In using the first three principles, confidence increased quickly in the ability to see at night by identifying the objects on the screen. These are the very basic fundamentals of night vision. Once observers have confidence in their ability to see at night, they are well on their way to successful night operations.

LESSON 12 — INDIVIDUAL NIGHT MOVEMENT

Aim

316. To teach and exercise the squad in individual night movement.

Student Performance Objectives

317. At the completion of this lesson, students must be able to:

a. Prepare themselves for night movement by camouflaging, and minimizing the risk of making noise.

b. Explain the general rules for night movement.

c. Walk or crawl silently at night.

d. Demonstrate the action to be taken when caught by enemy lights.

Stores

318. **a.** Dark adaptation goggles.
b. General Purpose Machine Guns.
c. Camouflage cream, charcoal, etc.
d. String.
e. Adhesive tape.
f. Whistle.

Period

319. One 40 minute period — lesson.

Notes

320. Students are to be dressed in patrol order and carry rifles.

Preliminaries

321. Safety precautions on all weapons.

Approach

322. *Explain the aim and continue.* Darkness provides most of the concealment at night, but treat a bright night much the same as daylight.

323. To remain concealed in the dark, camouflage all equipment and cover anything that might gleam in moonlight. Blacken the exposed skin completely, using soot, charcoal, etc, but do not use anything greasy as it may reflect light.

324. To minimize the risk of making noise:

a. Tie string around the trousers at the ankles, knees and thighs, to prevent the legs from swishing together.

b. Tape the sling swivels to the rifle and ensure the oil bottle does not rattle in the butt trap. Check that the spare magazines do not rattle in the equipment. Secure any rattling parts of a GPMG, using tape, string and hessian.

c. Wear a soft hat or go bare headed.

325. Achieve the first student performance objective by practising the squad in preparing themselves for night movement.

General Rules for Night Movement

326. *Explain.* Night movement demands more silence than daylight movement, and the following general rules should be applied:

a. At night, people hear more than they see, so silence is vital. To move silently at night, move slowly. Rubber soled shoes are a help on hard ground.

AVOID SKYLINES

Figure 11

b. Move by bounds, that is short distances at a time. Halt, look, listen, then move again. Halt in cover or shadow if there is any; if there is not, lie down. Lying down, an observer is not likely to be silhouetted against the sky; on the other hand, more things will be skylined to him, and he hears better with his ears near the ground or on it. If a suspicious noise is heard when moving, it is usually best to freeze for a moment to look and listen, and then slowly and silently take cover or lie down. See Figure 11.

c. Move in the open as much as possible to avoid making unnecessary noise and to allow a better view of the terrain for navigation.

d. Take advantage of sounds such as artillery, planes, wind, etc, to cover any movement .

e. Avoid running at night except when absolutely essential. Running increases noise, and there is a risk of injury through falling over obstacles.

327. Achieve the second student performance objective by questions from and to the squad.

How to Move at Night

328. *Explain and demonstrate the methods of moving silently at night.* The following methods are used when extreme silence is necessary, because of the nearness of the enemy. The move-

THE WALK

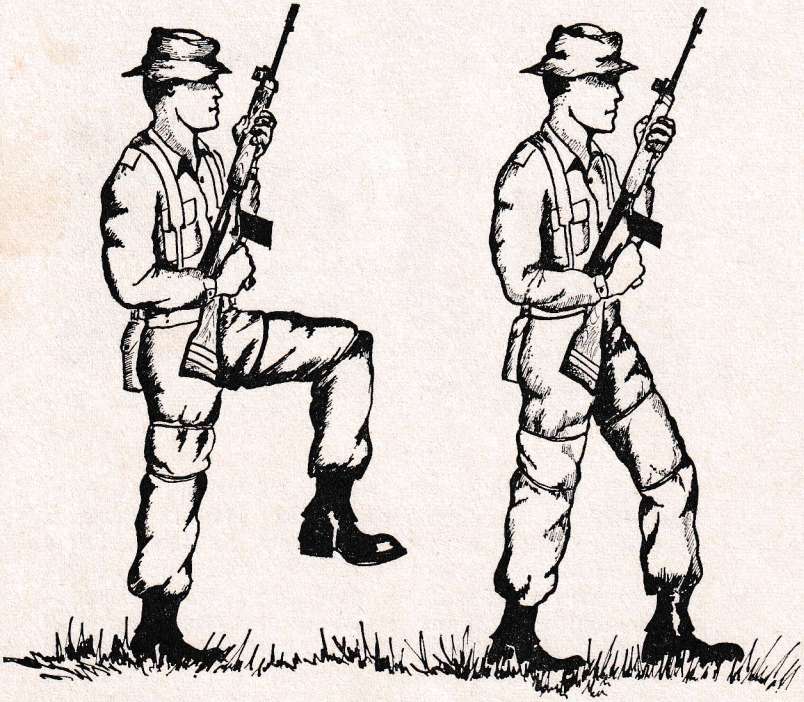


Figure 12

ment achieved is very slow and tiring, and should only be used when absolutely necessary.

329. *The Walk.* See Figure 12:

a. Balance the weight on the rear foot. Raise the other leg high to clear any scrub or grass.

b. Put the toe down first and feel gently for a firm foothold free of twigs.

c. Transfer the weight carefully onto the forward foot.

d. Carry the weapon at the high port.

330. Practise the squad.

331. *Crawling*:

a. Crawling on the hands and knees is the same as that executed in daylight, but the free hand must carefully clear dry bush from the ground ahead.

b. Crawling flat on the ground, as taught for day time is far too noisy to use at night. To crawl quietly at night:

(1) Lie on the stomach, legs together, arms extended about half way forward.

(2) Keep the weapon in the left hand and clear the way ahead of twigs, leaves, etc.

(3) Reach forward with the toes; raise the body clear of the ground on the forearms and toes, and carry it forward and gently to the ground again.

332. Achieve the third student performance objective by practising the squad, walking and crawling at night. Add realism by having them wear dark adaptation glasses.

Action When Caught by Enemy Lights

333. *Explain and demonstrate.* The enemy uses flares and other devices to light up the battlefield; when caught by sudden illumination:

a. Where there is cover, get quickly behind it. When caught in the open, drop quickly to the ground and lie motionless.

b. In close country, particularly jungle, it is best to remain motionless. The enemy is likely to be nearer than in open country, therefore going to ground could make sufficient noise to attract his attention.

c. Preserve the night vision of one eye by keeping it closed.

334. Achieve the fourth student performance objective by practising the squad in night movement through various types of terrain. Have them wear the dark adaptation goggles and give whistle blasts to simulate the exposure of enemy lights.

335 to 337. Reserved.

Conclusion

338. Questions from and to the squad.

339. Sum up the main points, which are:

a. The preparation for night movement.

b. The general rules for night movement.

c. Walking or crawling silently at night.

d. The action to be taken when caught by enemy lights.

LESSON 13 — DETECTION OF MULTIPLE TARGETS BY A COMBINATION OF SOUND AND MOVEMENT

Aim

340. To teach and exercise the squad to detect multiple targets by a combination of sound and movement.

Student Performance Objectives

341. At the completion of this lesson, students must be able to:

a. Explain how to choose which target to aim at and engage.

b. Detect multiple moving targets by a combination of sound and movement.

Stores

342. **a.** Aiming devices.

b. Camouflage material.

c. Master trial sheet per instructor.

d. Answer sheet per student.

e. Public address system.

f. Target trial sheet per targetman.

g. 110 Rounds of 7.62mm Blank.

Period

343. Two hours — lesson.

Notes

344. The staff required for the successful conduct of this lesson, and their various duties, are as follows:

a. The Principal Instructor (PI):

(1) Rehearsal of assistants and fatigue men.

(2) Conduct of the lesson.

b. Two Assistant Instructors (AI):

(1) Controlling observers.

(2) Assist in scoring.

(3) Assist the PI as required.

c. At least four fatigue men, dressed in battle order, are to occupy target locations and act as hostile targets, executing actions similar to those detailed in the Sample Master Trial Sheet. See Appendix 5 to Annex B.

345. Students are to be allocated two per aiming device, and each one is to have an answer sheet.

Preliminaries

346. Carry out safety precautions on all weapons to be used. Organize an arc of observation, including reference points, and revise the following:

a. The indication and recognition of targets.

b. How and when to engage a detected moving target.

c. The factors which complicate the remembering of multiple targets locations.

Approach

347. *Explain the aim and continue.* The detection of single and multiple moving targets and the location of targets by sound, have thus far been considered separately. To engage a combination of moving and firing targets an observer needs to be skilled in remembering the points where they disappeared, and the firing indications, long enough to fire effectively at them.

348. Normally, in battle, targets do not move towards a position unless they have covering fire. In this lesson some of the targets will move towards the observers while the others give covering fire from realistic fire positions.

Aiming and Engaging Detected Targets

349. *Explain.* When detecting and remembering the location of a number of targets it is normally difficult to remember

more than one or two. In this lesson there will always be four targets in each trial, some firing and some moving, so the successful completion of these trials indicates a very high standard of target detection.

350. The observer should not get excited where there are many targets available. He engages them by firing a well aimed shot at one target, then trying to pick up the others. In this lesson the problem is whether to engage a target firing at you or one moving towards you. The choice will depend on:

a. Aiming or reference points. When there is a choice of engaging two targets, one with an aiming point and the other with a reference point, engage the difficult target first, because the aiming point is easier to remember.

b. The nearer a target is the more dangerous it is and also the more easy it is to hit. Fire at the nearest target and remember the others as they disappear.

351. Achieve the first student performance objective by questions from and to the squad.

Detecting Multiple Targets

352. Achieve the second student performance objective by conducting trials similar to those shown in Appendix 5 to Annex B.

353. The detection of targets by sound will be somewhat unrealistic in that only the *"thump"* of the firing weapon will be heard because the firers are using blank ammunition.

354. Four targets will appear on every trial and their movement or firing will take place at the same time. Watch the targets as they fire or move and then align an aiming bar on each point of aim. Work from right to left on the aiming bars. If in doubt ask an assistant instructor.

355. Get the targets to stand up after the students have aligned their aiming bars and have the other man of each team check his partner's aims and enter the result on an answer sheet. See Appendix 6 to Annex B.

356. Change observers after every trial. Invite comment on the following:

a. The nearness of the targets.

b. The potentially dangerous targets.

c. The choice of a target to engage.

d. The ease or difficulty experienced in remembering target locations.

357 to 358. Reserved.

Conclusion

359. Questions from and to the squad.

360. Sum up the main points, which are:

a. The choice of the most dangerous target to shoot at.

b. The detection of multiple targets by a combination of sound and movement.

LESSON 14 — NIGHT OBSERVATION, AND IDENTIFYING SOUNDS AT NIGHT

Aim

361. To teach and exercise the squad in:

a. Observing at night.

b. Identifying sounds at night.

Student Performance Objectives

362. At the completion of this lesson, students must be able to:

a. Observe at night and appreciate how difficult it is to judge distances and aim.

b. Identify sounds at night and arrive at a logical conclusion from what they have heard.

Stores

363. **a.** Camouflage materials.

b. Hand lamps.

c. Range cards (AAF C75).

d. Clipboards with paper and pencil.

e. Defence stores and weapons. See Paragraph 378 c.

Period

364. Two 40 minute periods — lesson.

Notes

365. The lesson is to begin just before sunset. The squad is to be dressed in battle order.

366. Choose an area, unfamiliar to the students, with undulating ground and with trees on a skyline.

367. Carefully rehearse the enemy party on a night which is expected to provide light conditions similar to those anticipated

for the lesson. The enemy should be dressed in patrol order and are to be suitably camouflaged.

368. The Principal and Assistant Instructors should have prepared range cards for the initial phase of the lesson.

Preliminaries

369. Carry out safety precautions on all weapons and get the enemy into position.

370. Revise the principles of night vision and how they are applied.

Approach

371. *Explain the aim.*

Night Observation

372. Achieve the first student performance objective by practising the squad in night observation, as given in the following phases.

373. *Phase* 1.

a. Paint a simple tactical picture; have the men scan the area of responsibility for the enemy. Point out any prominent objects.

b. As it gets darker, let the men discuss how different everything looks, and get the enemy to move about. Every now and then have the squad take aim, so that they experience the difficulty in aiming.

c. Exercise the squad in judging distance.

d. Stress how difficult it becomes to see things in the distance, except when they are silhouetted.

374. *Phase* 2.

a. As soon as it is really dark, get one man to walk normally away from the squad, and to count his paces. As soon as no one can see him, stop him, and ask him how many paces he has taken. Then send him another 50 metres or so away, and get him to walk towards the squad. Stop him as soon as anyone sees him; then call him back to the squad, and make him count his paces again.

b. Stress the distance that can be seen at night, and the way things show up best against the sky. Point out how easy it is to mistake bushes, etc, for men at night, and how important it is, therefore, to study the ground carefully in daylight.

375. *Phase* 3.

a. Ears take the place of eyes at night, and interpret night noises. To hear better at night:

(1) Keep quite still, lean forward a bit, half open the mouth, and turn one ear towards any sound.

(2) If it is thought there are men about, keep one ear close to the ground.

(3) Never cover the ears; it is like being blindfolded by day.

b. Get the enemy to act appropriately, and point out how well a lighted match or cigarette shows up, what a noise a steel helmet or arms can make, how the noise of talking and coughing carries, and how easy it is to underestimate distances, and overestimate numbers.

376. *Phase* 4.

a. Have the enemy approach the observers, from a new direction, and try to remain unseen. Warn the squad to expect them.

b. Every time a man says he sees an enemy, order *"Stop";* send him out with an NCO to investigate, and to bring the enemy in if he is there. Start the enemy off again, and go on until they have all been spotted.

377. Questions from and to the squad. Sum up the progress made in night observation.

Identifying Sounds at Night

378. Achieve the second student performance objective as follows:

a. Position the squad in the lying position, at about grenade throwing distance from an enemy defensive position. The squad are to work in pairs, each pair having a torch and a piece of paper on a clipboard.

b. Signal the enemy to make sounds, in a prearranged sequence. The observers are to determine what the noise was, how far away and in which direction.

c. To make noises, the enemy can do many things, for example, dig, revet, knock in pickets, change magazines, open and close a rifle breech, load and unload various weapons, post sentries, talk and whisper, blow their noses, cough, crack twigs, knock a rifle against a steel helmet, cut wire, walk over all sorts of ground, fill sandbags, load a truck with jerricans, etc, and finally, after a period of silence, creep up on the observers.

379. It is important that the squad are encouraged to arrive at some conclusion from what they have heard, eg, the enemy is heard filling magazines. They are either poorly trained or have just received an ammunition re-supply.

380. Questions from and to the squad. Sum up the achievements of the exercise.

381 to 383. Reserved.

Conclusion

384. Questions from and to the squad.

385. Sum up the main points, which are:

a. Observation at night.

b. Identifying sounds at night.

LESSON 15 — DUTIES OF A NIGHT SENTRY

Aim

386. To teach and exercise the squad in the duties of a sentry at night.

Student Performance Objectives

387. At the completion of this lesson, students must be able to:

a. Explain the duties of a night sentry.

b. Perform the duties required of a night sentry.

Stores

388. **a.** Camouflage materials.

b. GPMG.

c. Stores for an improvised fixed line.

d. Stores for a section defensive position.

Period

389. One 40 minute period — lesson.

Notes

390. Lay out a section defensive position and rehearse a small party for the demonstration in Paragraph 396.

Preliminaries

391. Carry out safety precautions on all weapons. Get the

demonstrators in position.

Approach

392. *Explain the aim and continue.* In battle, the lives of those in the section will often depend on how well the night sentry knows his duties and how conscientiously he is prepared to carry them out.

Duties

393. Explain that sentries are always posted in pairs at night and the things they must know are:

a. All sentries:

(1) What ground to watch.

(2) What to do if anyone approaches their posts.

(3) The password.

b. Sentries in forward areas:

(1) The direction of the enemy.

(2) Where their neighbouring posts are.

(3) The names of prominent landmarks in front of them.

(4) Details of patrols, that may leave or return, through or anywhere near their posts.

c. The signal for defensive fire (DF) for a MG laid on a fixed line, and how much fire is to be delivered for how long.

394. Achieve the first student performance objective by questions from and to the squad.

395. *Explain and demonstrate.* An important duty of a night sentry is to challenge people that approach his post. The challenge is simply a means of causing an unidentified person or party to halt and be identified. The password identifies the person or party challenged. The correct procedure is as follows:

	Action by sentry	Action by people challenged
a.	Orders *"HALT — WHO'S THERE"* and covers the stranger with a weapon.	Stand still and answer, eg, *"SGT JONES — A COMPANY"*.

	Action by sentry	Action by people challenged
b.	*Orders "ADVANCE"*, or, if more than one person has approached, *"ADVANCE ONE"*.	One man advances toward sentry.
c.	Orders *"HALT"* when the person advancing is close enough to hear a softly spoken password.	Stand still and wait to hear the password.
d.	Gives password in a soft voice, eg, "BUCKET", and waits for the correct countersign, or,	Gives countersign in a soft voice, eg, "BRIGADE", and state how many in the group, or,
e.	Ask questions that only an ally would know and establish the identity of the person.	Answer questions asked by the sentry.
f.	Have the leader of the group identify each of his party as they pass.	Remain with sentry and identify each member of the party.

396. *Demonstrate as follows.* A friendly patrol approaches. The sentry has a string with the ends tied to his own and the section commander's wrists. As soon as he sees the patrol, he tugs the string to wake the section commander, who rouses the section in the same way. The section stands to, and sentries and section cover the patrol; one sentry challenges. The patrol are correctly identified and permitted to pass.

397. Achieve the second student performance objective by squad practice.

398 to 399. Reserved.

Conclusion

400. Questions from and to the squad.

401. Sum up the main points, which are:
   a. The duties of a night sentry.
   b. The correct challenging procedure.

LESSON 16 — KEEPING DIRECTION

Aim

402. To teach and exercise the squad in keeping direction in day time and at night.

Student Performance Objectives

403. At the completion of this lesson, students must be able to:
   a. Explain how to maintain direction by natural features.
   b. Determine direction by using the watch and sun, and use this method to keep direction.
   c. Determine direction at night, using the stars.

Stores

404. Watches.

Period

405. One 40 minute period — daylight lesson for Paragraphs 412 to 414.

406. One and one half hours — night lesson for Paragraphs 415 to 418.

Notes

407. Prepare a short course for daylight practice at keeping direction, and another short course for night practice.

Approach

408. *Explain the aim and continue.* The map and compass are the best means of keeping direction. When these are not available, there are other aids which can be utilized to keep direction.

Natural Features

409. Nature provides many landmarks to aid the maintenance of direction, such as principal rivers and streams, and large land masses such as mountains.

410. An alert soldier notes and remembers the location of peculiar terrain features and the position of outstanding ground

forms. He should glance back often as he moves along so as to get the general impression of what the terrain would look like if it was necessary to retrace that route.

411. Achieve the first student performance objective by questions from and to the squad.

Determining Direction — Watch and Sun

412. *Explain and demonstrate.* The watch and the sun may be used to find north. See Figure 13. In the North Temperate Zone, with the watch set on standard time, hold the watch face up in the hand or place it on a flat surface. Turn it until the hour hand points directly at the sun. To be sure the hour hand is pointed correctly, hold a small stick vertically beside the watch at the end of the hour hand. Turn the watch until the shadow of the stick falls along the hour hand. Without moving the watch, divide the smaller angle between 12 o'clock and the hour hand into two equal parts. One way to do this is to count the number of minute spaces between the hour hand and 12 o'clock and divide by two. An imaginary arrow from the centre of the watch through this half-way point on the edge of the watch points south; the opposite direction is north.

DETERMINING DIRECTION — WATCH AND SUN

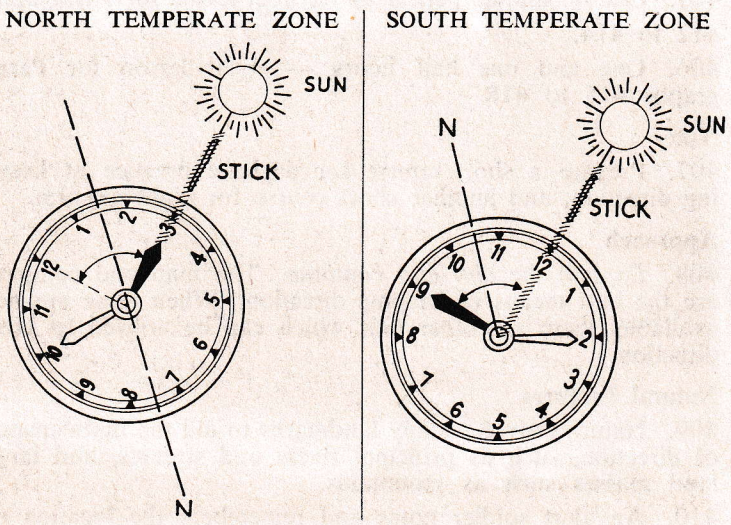


Figure 13

413. In the South Temperate Zone, with the watch hand set on standard time, place the watch on a flat surface and turn it so that 12 o'clock points directly at the sun. Without moving the watch, divide the smaller angle between 12 o'clock and the hour hand into two equal parts. An imaginary arrow from the centre of the watch through this half-way point on its edge points north.

414. Achieve the second student performance objective by squad practice. Exercise the squad in navigating a short distance, through difficult terrain, by maintaining a northerly direction.

Determining Direction at Night

415. *Explain.* The North Star shows true north in the Northern Hemisphere, and is accurate all year round. To find the North Star, look for the Big Dipper. See Figure 14. The two stars at the end of the bowl are called the pointers. Look in the direction that water would pour from the dipper. In a straight line out from the pointers (at about five times the distance between the two pointers) is the North Star. Remember that the Big Dipper rotates slowly about the North Star and will not always appear as shown in the illustration.

416. The constellation Cassiopeia can be used to find the

LOCATING THE NORTH STAR

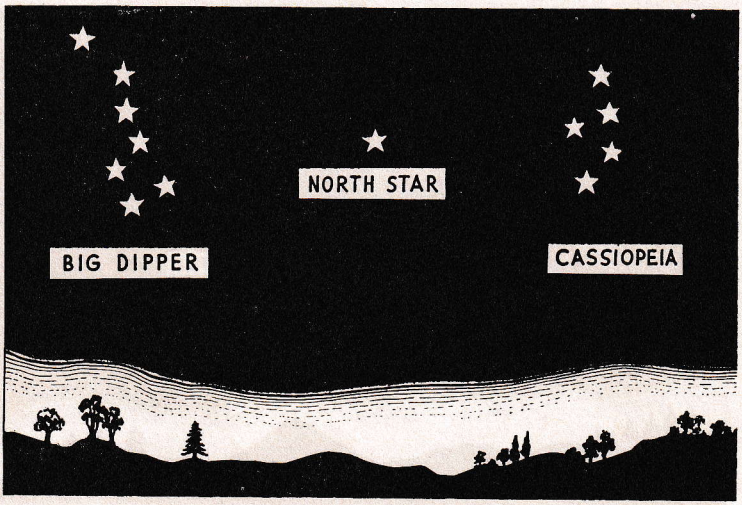


Figure 14

North Star. This set of stars is shaped like a lopsided M. The North Star is straight out from the bottom point of the M about the same distance as from the Big Dipper.

417. South of the equator, the Southern Cross may be used to find direction. Unfortunately there is no prominent star to find south, but the approximate direction may be found by measuring straight out from the foot of the cross, a distance five times the length of the cross itself. This imaginary point is the general direction of south. The stars of the long axis of the cross are the pointers. See Figure 15.

418. Achieve the third student performance objective by squad practice. Exercise the squad in navigating a short distance, through difficult terrain, by maintaining a southerly direction using the Southern Cross.

419 to 420. Reserved.

Conclusion

421. Questions from and to the squad.

422. Sum up the main points for keeping direction:

a. Using natural features.

b. Determining, using the watch and sun.

c. Determining direction at night.

LOCATING SOUTH BY THE SOUTHERN CROSS

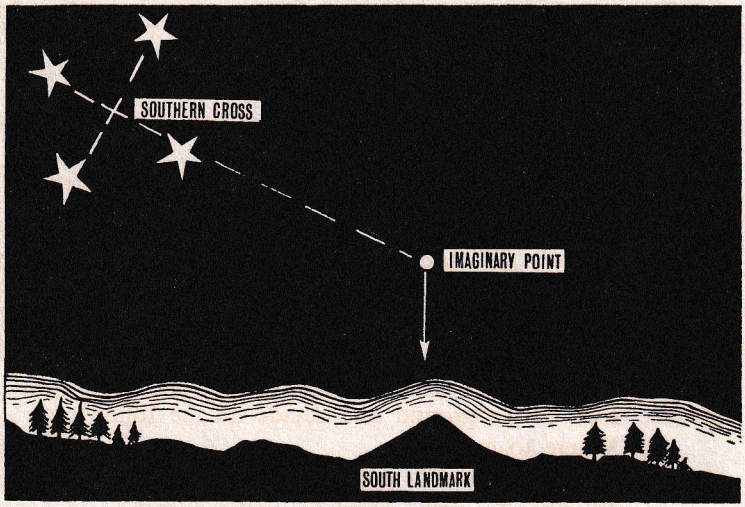


Figure 15

LESSON 17 — STALKING

Aim

423. To teach and exercise the squad in selecting a line of advance, and stalking.

Student Performance Objectives

424. At the completion of this lesson, students must be able to:

a. Select a line of advance, plan and execute a well concealed movement.

b. Plan and execute an individual stalk.

Stores

425. **a.** Camouflage materials.

b. Drill grenades.

c. 7.62mm Blank.

d. Clipboards with paper and pencils.

Period

426. Three 40 minute periods — lesson.

Notes

427. Students are to be dressed in battle order and carry rifles.

428. Choose ground with room to disperse the squad widely, and on which there are objectives, starting points, and a choice of several lines of advance.

429. Start with courses about 200 metres long and gradually lengthen them to about 800 metres.

Preliminaries

430. Carry out safety precautions and revise the requirements of a good fire position.

431. Divide the squad into groups of about three men.

Approach

432. *Explain the aim and continue.* Before moving from one point to another in battle, the position to move to, and the best route to it, must be carefully chosen.

Choosing a Line of Advance

433. *Explain and demonstrate.* To choose a route on which to advance, look at the ground and decide on the following:

a. Where to make for.

b. The best route to get there.

c. Whether to walk, crawl, or make a rush.

434. An ideal line of advance is one which has en route:

a. Places from which to observe without being observed.

b. Good fire positions.

c. Cover to conceal the movement.

d. Cover from fire.

e. No obstacles.

435. Unfortunately all of these things seldom go together. While low ground is generally best for cover, high ground is usually best for observation and shooting.

436. Choose the best route according to the circumstances; plan the move and execute it according to plan. Continue advancing in bounds, planning each in advance.

437. Achieve the first student performance objective by practising the squad as follows:

a. Point out the ground to be used, the general direction of the enemy, the objective, and the limits within which the squad must plan their route.

b. Give the squad a time limit within which to plan their first bound in detail. Discuss the plans made.

c. Choose the plan likely to bring out the most lessons and have each group in turn, follow that route. Discuss the movement, at the end of each bound, from the enemy's point of view.

Stalking

438. *Explain.* To stalk the enemy, it is necessary to employ all of the knowledge and skills that have been taught in fieldcraft and weapon training.

439. It is first necessary to plan the stalk as follows:

a. Find the enemy by observation, and memorize his position.

b. Choose the objective, the position from which to kill the enemy, and the route, taking into consideration.

(1) Cover from fire and view, and dead ground.

(2) Bounds.

(3) Obstacles.

(4) Other enemy positions, known or probable.

(5) Possible alternative routes, in case of need.

(6) How to keep direction.

440. To defeat the enemy, much depends on the circumstances and the reactions to any emergency which may arise. The following should always be remembered:

a. Be alert; never relax.

b. Observe carefully at the end of each bound.

c. Think about possible fire positions, in the event of being surprised.

d. Take advantage of noises, aircraft, gunfire, etc.

e. Try not to disturb animals or birds.

f. If it is necessary to take risks, take them early rather than late.

g. Remember that, to finish up by missing the enemy with the shot, at the very best, the time and effort will have been wasted.

441. Achieve the second student performance objective by questions from and to the squad and practise them as follows:

a. Divide the men into threes, a stalker, a victim and a recorder. Explain the three men's tasks:

(1) *The stalker.* To make a plan, stalk his victim, and kill him either with a short range rifle shot or with a grenade. For safety's sake, if he uses a grenade, he must shout *"Ready to throw"* before he throws it. The victim must move away from his position.

(2) *The victim.* To watch, and fire a blank round, whenever he sees the stalker; and to tell the recorder how well he saw him, how accurately he was able to shoot, etc.

(3) *The recorder.* To watch the stalker, and record the victim's reports.

b. Put the victims and observers in fire positions, and tell the stalkers roughly where they are. Show the stalkers their start lines and reconnaissance areas; explain the rules to them, and start them off.

c. Hold a short discussion at the end of each stalk.

442 to 444. Reserved.

Conclusion

445. Questions from and to the squad.

446. Sum up the main points, which are:

a. Planning a line of advance and executing a well concealed movement.

b. Planning and executing an individual stalk.

CHAPTER 2 — ADDITIONAL INFORMATION FOR INSTRUCTORS

SECTION 1 — GENERAL

1. This chapter contains additional information for instructors, to help them to understand the subject more thoroughly, and to make training more varied.

2. The skills and techniques taught in this pamphlet are to be exercised by the soldier throughout his weapon and field training. Instructors must be constantly alert to spot and correct faults, and are to insist on the highest possible standard of fieldcraft and target detection at all times.

3. Individual and team battle exercises, which continually require a high standard of fieldcraft and target detection, are to be found in, *"IT Vol* 1, *Pamphlet No.* 11."

SECTION 2 — OBSERVATION OF FIRE AND RANGING

4. The best way to teach this subject is by demonstration on a field firing area. Paragraphs 6 to 21 below suggest the the form such a demonstration might take, with brief notes on which to base a commentary.

5. Everyone should attend an elementary lecture on the theory of small arms fire before this demonstration is staged.

Phase 1

6. *Demonstration.* Use a MG with its sights set low, the bullets will strike short; adjust the sights until they hit the target.

7. *Commentary.* Always observe your fire; if you judge the range badly, or if your weapon is wrongly sighted, it is the quickest and surest way to correct both errors, and get your bullets to hit the target.

Phase 2

8. *Demonstration.* First a MG, and then a rifle group, fire at a ground target.

9. *Commentary.* It is far easier to observe the fire of a MG, because of the number of bullets that strike the ground in

quick succession, than of riflemen; so it is normally better to use MG fire as the basis for applying a section's fire to a target.

Phase 3

10. *Demonstration.* Get a MG to fire onto various types of ground.

11. *Commentary.* It is easier to observe fire on dry ground, sand or short grassland, or on water, than on wet ground, long grass or standing crop.

Phase 4

12. *Demonstration.* Get a MG to fire onto a ground target.

13. *Commentary.*

a. The aim is to apply the centre of the beaten zone to the target. If you can see shots strike both short of the target and beyond it, you have achieved your aim.

b. There are always a few wide shots round the edge of the beaten zone. Never take a single bullet strike as the centre of the beaten zone; if the ground shows one strike, it would show more if they were there.

Phase 5

14. *Demonstration.* Get a MG to fire onto level ground and a forward slope with different ranges set on the sights; a stop butt can serve as a forward slope.

15. *Commentary.*

a. Make bold sight alterations, seldom less than 100 metres at a time, particularly if you are firing onto a forward slope, when a 100 metre alteration lifts the beaten zone only very little.

b. The beaten zone is shorter on a forward slope than on level ground; you must therefore apply it more accurately to the target.

Phase 6

16. *Demonstration.* Get a MG to fire at a target with dead ground immediately behind it, so that no bullet strikes can be seen: then reduce the range boldly, observe the strikes well short of the target, and correct onto the target from there.

17. *Commentary.* If you cannot see any strikes at all, lower the sights 200 or 300 metres, and watch for strikes short of the target; then move the beaten zone onto the target by observation or, failing that, by estimation.

Phase 7

18. *Demonstration.*

a. Get a MG to fire tracer at a group of Figure 11 targets on level ground, with the beaten zone falling beyond the target. Put the spectators to a flank, roughly level with the target.

b. If no tracer is available, arrange a series of targets one behind the other, so that the bullet holes show the trajectory.

19. *Commentary.* On level ground a target may be short of the beaten zone, but in the dangerous zone. If you are firing at targets, like walking men, on fairly level ground, at not more than 600 metres, it is usually best to put the beaten zone a bit beyond them. Fire unit commanders seldom remember this.

Phase 8

20. *Demonstration.* Get a MG to range onto a convenient point. Then put up fleeting targets in the area.

21. *Commentary.* By ranging, we mean finding the exact range to a likely target, such as a gap in a hedgerow, by shooting at it before there are any enemy there. When a target does appear, you will be able to hit it quickly, but you may lose surprise; and you must decide whether it is worth while.

SECTION 3 — FIELDCRAFT GAMES AND EXERCISES

22. Fieldcraft games and exercises are most useful; not only do they exercise trained or half trained men in an interesting way, but also a few instructors can handle a lot of men.

23. This section suggests a number of basic games and exercises. After any of them, hold a short discussion to bring out the lesson. See Section 4.

Exercises and Games for Day Time

24. *Keeping direction.* Choose a start point and two objectives, in the form of a triangle. Send the men off one by one to the first objective, where another instructor sends them on again to the second objective; there a third instructor tells them to find their way back to the starting point.

25. *Observing.*

a. Get a rehearsed party of men to move about the area of observation, creating realistic incidents, approaching from different directions, firing various weapons, digging, observing, etc.

b. Include battle inoculation, with charges to simulate mortar and artillery fire, if on a field firing area.

c. NCO supervisors should have a time chart of incidents; they can then get men to indicate targets, and check their interpretations of what they have seen.

d. To test the men's powers of concentration, have a period in the middle when nothing happens.

e. The men should record what they see in notebooks, which can then be used as the basis of a competition. Question the men at suitable intervals, and give them credit for sound deduction.

26. *The enemy's point of view.*

a. Choose a friendly and an enemy post about 300 metres apart, and in view of each other. Put demonstration men or dummies in the friendly post.

b. Bring the men up behind the friendly post, and from there get each of them to study its background, etc., and decide how much of it the enemy could see, and whether the enemy would find it easy to give a fire control order onto it.

c. Take the men across to the enemy post to see how well they worked out the answer.

27. *Movement.* Choose a triangular or four sided course over ground with all types of cover, with the corners about 100 metres apart, and an instructor and squad at each corner. Each squad sends off individuals or pairs in both directions, at intervals, to stalk round the course. Men not stalking can watch and criticize. A number of umpires are needed round the course to assess the results of each meeting, and keep the score.

28. *Spotting and freezing.*

a. Divide the men into two teams of up to 20, to act as *"spotters"* and *"freezers"*. The spotters watch from high ground; the freezers start 250 metres away, and try to reach the finishing line, about 50 metres in front of the spotters, without being seen.

b. Blow a long whistle blast to show the beginning and

end of effective covering fire coming down on the spotters; blow two short blasts a few seconds after the second long one, to show that the spotters have their heads up again. Make the spotters turn their backs on the freezers each time between the first long blast and the two short ones; on the two short blasts, let them turn round and try to spot the freezers.

c. Between the two long blasts the freezers must run forward; between the second long blast and the two short ones, they get to cover; between the two short blasts and the next long one they may not move. Any man seen by the spotters is *"dead"*.

d. Both teams should act as both spotters and freezers; the team that gets the most men over the finishing line *"alive"* wins.

29. *Hunger crawl.*

a. Choose ground with plenty of low cover, but such that umpires can still see what is going on. Each game requires a strip of ground about 200 metres long, two teams of three and an umpire. It may be possible to run several games at once. Umpiring is good practice for potential NCOs.

b. Put something to represent an air drop of food in the middle of the strip of ground; if necessary, mark it with a sheet on a bush, representing the parachute.

c. Show the teams the ground and the boundaries, and arm each man with a clod of earth to represent a grenade. Start the teams off at opposite ends of the ground with orders that anyone who fails to reach the food in 15 minutes dies of starvation. A man can also kill an opponent by throwing a *"grenade"* to land within ten feet of him.

30. *Concealment.*

a. Divide the men into two teams of hiders and seekers. Make the seekers turn their backs, and send the hiders about 150 metres away from them with an instructor. Blow a whistle to make the hiders stop and hide where they can watch the seekers. The instructors then make sure that the hiders can see the seekers. After a pause tell the seekers to turn round and try to spot the hiders inside two minutes.

b. Discuss results, point out mistakes, and suggest how

the men could do better. Change the teams round, and repeat the exercise.

Exercises and Games for Night Time

31. *Identifying sounds.*

a. Divide the men into two teams. Put one team in a listening post, marked by tapes, about 20 metres from a small wood, and forbid them to leave the post. Give the other team a list of things to do and where to do them, and the necessary stores. The first team tries to identify the sounds.

b. Here is a suggested list from which to choose a 30 minute programme for the second team; arrive at the far side of the wood in a truck, unload the truck, start to dig a slit trench, burn some paper, lay mine tapes, rescue a *"wounded"* dummy from near the listening post, put up a bivouac, fill up the truck with gasoline from a jerrican, reload the truck and move off.

c. Discuss results, change the teams over, and repeat the exercise with a different programme of sounds.

32. *Obstacle course.* Prepare an obstacle course, with some wire and trip flares; crawling should be necessary over parts of it; if it is on a field firing area, it is a good idea to include battle inoculation. Sentries along the course, to watch and criticize, are useful. The men prepare for battle, and go over the course in pairs, five minutes apart.

33. *Lamp stalk.* Put two lamps 200 to 300 metres apart, each one visible from the other. Divide the men into two teams (not more than 12 in each). One team, moving individually, try to reach the second lamp from the first: the other team lie up and try to capture them: they are not allowed within 50 metres of the second lamp.

34. Vary numbers and distances according to the ground and the darkness of the night. Men usually take from 30 to 60 minutes to reach the second lamp successfully.

35. *Tank hunt.* Choose not too dark a night, and let the men see air photographs, if possible, and study the ground with binoculars from the start point by day. Put out torch *"sidelights"* to represent an enemy tank. Send the men off to hunt the tank in pairs with drill section or platoon anti-tank weapons.

36. *Attack and defence stalk.*

a. Divide the men into two teams, and give them each

a well defined area about 200 yards square, such as a wood or field, with a lamp and a neutral NCO somewhere in it. Establish a prisoners' cage under another neutral NCO just outside each area. The areas should be about 500 metres apart.

b. Divide each team into attackers and defenders. The attackers work singly, and try to get into their opponents' area, and report to the NCO; he gives them a token with their name on it, which they must hand in to their own prisoners' cage, before they can try again. The defenders observe or patrol in pairs, and try to capture the attackers, and take them to their prisoners' cage. No one may enter his own area. Prisoners should be sent back by a *"safe"* route to try again, after their names have been taken.

c. After two hours, fire a light signal to end the exercise. Count the tokens and the prisoners in the two cages. A team scores one point for each token, and one for each prisoner they have captured.

SECTION 4 — **DISCUSSIONS AFTER EXERCISES**

37. Men learn by making mistakes and watching others make mistakes; much of the value of any exercise lies in the conference or discussion that should take place as soon as possible after the end of it.

38. These hints apply to any small exercise of the kind that this pamphlet describes.

39. *Preparation for the discussion.*

a. Be clear about the aim of the exercise.

b. Be clear about the main lessons to be taught; these should be obvious from the aim and the mistakes that have been made.

c. Be clear exactly what happened during the exercise; this often means questioning both sides.

40. *The discussion.*

a. Get the individual or the leader to say what orders he received, what he did, and why he did it.

b. Get the critics to say what they noticed, good and bad.

c. Ask for any other contributions.

d. Sum up the main factors, the courses open, the suggested plan, and the lessons to be learned.

SECTION 5 — TARGET DETECTION TESTS

Aim

41. *To test the soldier's ability to*

a. *Test* 1. Detect and estimate ranges to single, stationary battlefield targets.

b. *Test* 2. Detect, and remember locations to, single and multiple moving targets.

c. *Test* 3. Detect multiple targets by sound.

Stores

42. **a.** Public address system.

b. Master trial sheets.

c. Answer sheets.

d. Target trial sheets.

e. Clipboards and pencils.

f. 7.62mm Blank:

(1) Test 1-15.

(2) Test 3-30.

Period

43. One half hour period per test.

Notes

44. A test supervisor, assistants, and the following target men are required:

a. *Test* 1. Two targets.

b. *Test* 2. Four targets.

c. *Test* 3. Two targets.

45. Target men are to be suitably dressed, camouflaged, and carry rifles.

46. Test 1 is normally conducted in conjunction with the Recruit Qualification practice.

47. Tests 2 and 3 are normally conducted in conjunction with the Battle practice.

48. Rehearse the targetmen and assistants.

Approach

49. *Explain the aim of the test.*

50. Conduct the tests as set out in the following paragraphs.

Test No. 1

51. There are to be 12 trials each of four phases. Each progressive phase is easier to observe than the preceding one.

52. All answers are to be written on an answer sheet, similar to that shown in Appendix 2 to Annex B.

53. A qualifying score should be pre-determined by the supervisor, by conducting a test using an assistant as a test subject.

54. The supervisor will order *"TRIAL* 1, *PHASE* 1, *OBSERVE"*. There will then be 30 seconds in each phase in which to find the target. As soon as a target is located, take 3 paces to the rear and fill in the answer sheet. (Explain instructions on answer sheet.) Once a target is detected it is not necessary to observe any longer as the target will remain in its position for all four phases.

55. Check to see if all members are aware of the correct arcs and the location of all letter panels.

56. Select and conduct 12 trials similar to the trials in Appendix 1 to Annex B.

57. These trials should be fairly difficult, with the targets ranging from 30 to 300 metres. Include a good cross section of the different indications normally performed by the targets. Students should be able to locate all targets by the end of each trial (ie, after Phase 4 in the worst case).

Test No. 2

58. There will be 10 trials. On hearing *"TRIAL* 1 — *COM*-MENCE" search the detection range and try to locate any moving targets. There will be between one and four targets in each trial. The targets will disappear at the end of their movement and you then have 30 seconds in which to align an aiming bar on as many targets as can be remembered. Work from right to left on the aiming bars.

59. Having completed aligning the bars face away from the detection range, while the assistant supervisor checks the alignment. The assistant will then mark the answer sheet which the observer is to retain until the test is completed. See Appendix 8 to Annex B.

60. Practise soldiers in aiming at several specific points and get assistant supervisors to check so that there will be no misunderstandings during the test.

61. Ensure soldiers are aware of the boundaries of the range and tell them that no target will be outside those boundaries.

62. Conduct Trials 1 to 10 as per Appendix 7 to Annex B.

63. A qualifying score should be pre-determined by the supervisor, by conducting a test using an assistant as a test subject.

Test No. 3

64. Ensure soldiers know the location of all letter panels and the boundaries of the range. Issue answer sheets.

65. When a sound or sounds is heard, write down on the answer sheet, opposite the trial number, the letter panel or panels it is thought the sounds came from. See Appendix 10 to Annex B.

66. Conduct the trials as per Appendix 9 to Annex B.

67. A qualifying score should be pre-determined by the supervisor, by conducting a test using an assistant as a test subject.

ANNEX A

AIMING DEVICES — FIELDCRAFT AND TARGET DETECTION

1. Aiming devices are essential to training so that instructors can check on targets indicated or detected by individuals, to determine whether or not the instruction has been assimilated.

2. Four aiming bars are required on each device to allow for the detection of multiple targets.

3. Aiming devices should be constructed similar to that shown in Figure 17.

AIMING DEVICE

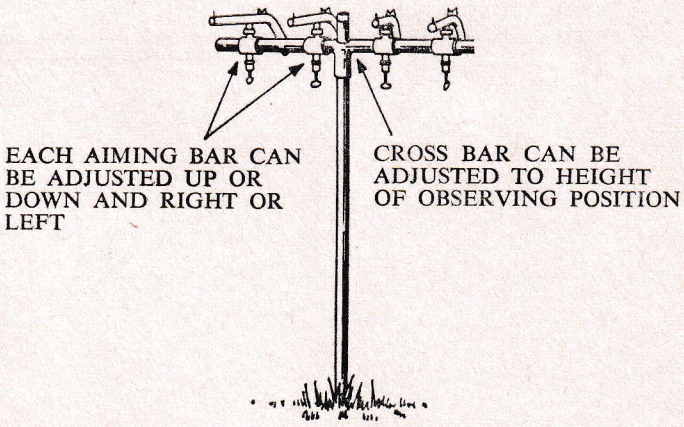


Figure 16

ANNEX B

TARGET DETECTION RANGE

1. Target detection is designed to be presented as concurrent training with 25 metre, static and mobile mechanical range practices, therefore it is desirable that the TD range be sited

TYPICAL LAYOUT FOR A TARGET DETECTION RANGE

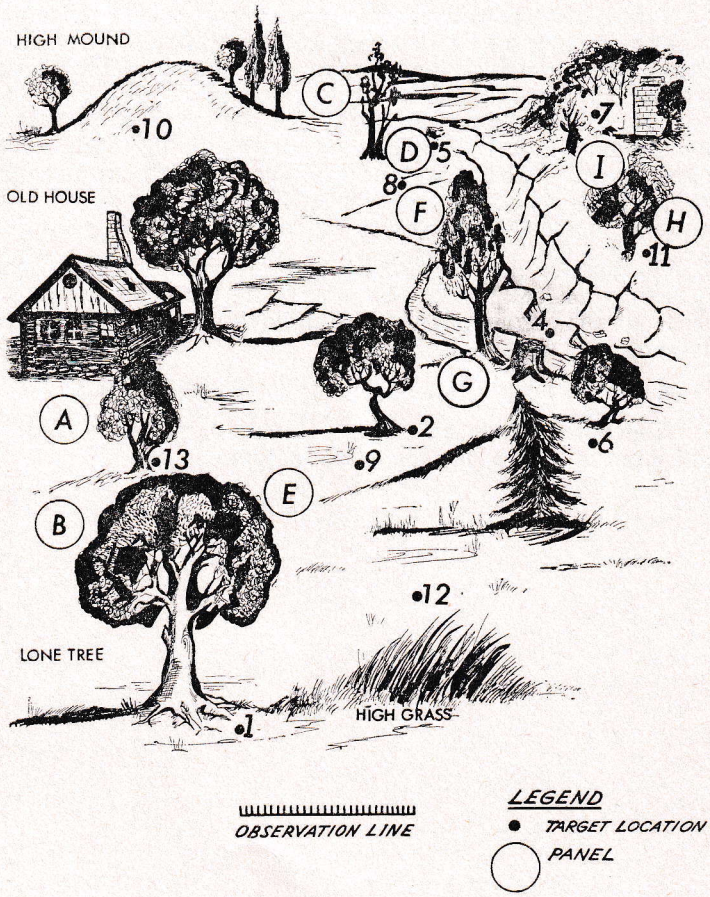


Figure 17

convenient to these ranges to allow rapid rotation of details. The TD range should not be so close that firing from the other ranges becomes confusing to observers detecting targets by sound.

2. The target detection range is constructed on terrain which affords a 300 metre visibility with a 1000 mil arc. Lettered panels are placed about the observation field to limit the detection area for the observer in certain detection exercises. The observation line is located on a good tactical firing position to add realism to the training.

3. Target detection training provides the soldier with the opportunity to practise detecting hidden and partially hidden targets in their natural surroundings. It also gives the soldier practice in locating targets by the sound of rifle fire. To properly train soldiers in target indications, human targets are located at likely hostile positions within the range area. These targets perform various indications which are detected by observers within a time limit. The observers are further required to estimate ranges to all targets.

4. Training in detecting single and multiple moving targets as well as detecting targets by sound (by use of blank rounds fired at the observation line) follows the same training pattern.

5. A typical layout of a TD range is shown in Figure 16.

6. Appendices 1 to 10 show Sample Master Trial Sheets, and Answer Sheets, for the various lessons.

APPENDIX 1 TO ANNEX B

LESSON 2 — SAMPLE MASTER TRIAL SHEET

SERIAL	LOCATION	RANGE	TARGET INDICATIONS (By Phases)
1.	H	26 M	(1) Slightly exposed — remain still. (2) Raise and lower head and shoulders slowly. (3) Move head and shoulders from side to side slowly. (4) Fire blank.
2.	A	90 M	(1) Slightly exposed — remain still. (2) Move head and shoulders from side to side slowly. (3) Raise head slowly, drop abruptly. (4) Fire blank from kneeling position.
3.	K	170 M	(1) Slightly exposed — standing — remain still. (2) Step back and forward 1 yard each 10 seconds (4 times). (3) Step to the side and back quickly each 10 seconds (4 times). (4) Fire blank.
4.	H	55 M	(1) Slightly exposed — remain still. (2) Shake bush gently each five seconds (5 times). (3) Raise and lower head slowly (bare steel helmet). (4) Fire blank.

SERIAL	LOCATION	RANGE	TARGET INDICATIONS (By Phases)
5.	J	150 M	(1) Exposed — kneeling — remain still. (2) Move head and shoulders from side to side. (3) Jump out and back each five seconds (twice). (4) Fire two blanks (10 seconds apart).
6.	C-H	55 M	(1) Slightly exposed — lying behind tree — remain still. (2) Kneel slowly then stand slowly. (3) Stand slowly, drop fast. (4) Fire two blanks 10 seconds apart.
7.	J-S	120 M	(1) Slightly exposed — kneeling — remain still. (2) Raise head slowly, drop abruptly each five seconds (four times). (3) Same as (2) but with bare steel helmets. (4) Fire two blanks 10 seconds apart.
8.	C	40 M	(1) Lying slightly exposed — remain still. (2) Raise head slowly, drop abruptly each five seconds (four times). (3) Roll to side and back (four times). (4) Fire blank.

			TARGET INDICATIONS (By Phases)
9.	A	50 M	(1) Lying position, raise and lower head and shoulders (four times). (2) Raise head slowly, drop abruptly (four times). (3) Repeat (2) with bare steel helmets. (4) Fire two blanks (10 seconds apart).
10.	C	100 M	(1) Slightly exposed, remain still. (2) Move from side to side slowly. (3) Same as (2) with bare helmet. (4) Fire blank.

APPENDIX 2 TO ANNEX B

LESSON 2 — ANSWER SHEET

NAME ..... DETAIL ..... DATE.....

Instructions

1. Do NOT change your answers. This is not a test.
2. There will be four phases in each trial. Each phase will be a different target indication, but the target is to remain in the same place for the four phases.
3. If you fail to detect a target during the phase place an "X" in the respective column. As soon as you detect a target take three paces to the rear and mark a "√" in the column for that phase.
4. Under LOCATION mark the letter of the panel nearest the target. If you are in doubt as to which letter panel is the closest write down the two letters the target is between.
5. Under range write down your estimate in metres. An error of 25 metres is allowable.

Serial No.	Phase Number 1	2	3	4	Location (Letter of nearest panel)	Range (Metres)
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						
15.						
16.						
TOTALS						

APPENDIX 3 TO ANNEX B

LESSON 6 — SAMPLE MASTER TRIAL SHEET

			DESCRIPTION OF ACTIONS
1	A	200 M	Standing exposed by tree. Adopt kneeling position. Slow movement to hidden position. Fire blank for smoke indication.
2	K	150 M	Repeat Trial 1 but select a poor aiming point.
3	P	175 M	Standing exposed. Disappear on command. Reappear in same position on command and make five 4 second rushes, disappearing at a good aiming point at the end of each rush. Fire blank on completion of rushes.
4	B	300 M	Kneeling behind bush. Make five 3 to 5 second rushes, disappearing at a poor aiming point at the end of each rush. Reappear from same position. Fire blank on completion of rushes.
5	0	300 M	Lying hidden. Make rushes of 4, 5, 8, 3 and 5 seconds. Disappear after each rush and roll or crawl to new position. Fire blank from last position.
6	L	175 M	Lying hidden. Make three 4 second and two 6 second rushes across the front of the observers to new position. Reappear at same point. Vary time between rushes. Fire blank at end of last rush.

			DESCRIPTION OF ACTIONS
7	J	175 M	Repeat in reverse. Crawl or roll to new position after disappearing. Fire blank at end of last rush.
8	C	200 M	Run 200 metres from behind tree to a position which is a poor aiming point and yet is cover from fire. Fire 2 blanks one minute after disappearing.
9	T	300 M	Lying hidden. 5 — L — 3 — 3 — 6 — R — 4 — L — 5. Fire blank from last position. (Numbers indicate duration of rush in seconds. Letters "L" and "R" indicate direction of roll or crawl after each rush.)
10	D	300 M	Start behind bush. 6 — 8 — R — 3 — R — 4 — 3. Fire round from last position. Select both good and poor aiming marks for each rush.

APPENDIX 4 TO ANNEX B

LESSON 7 — SAMPLE MASTER TRIAL SHEET

Trial No.	Location	No. of Men	Range	Description of Actions	Instructors' Notes
1	D	2	75 M	Phase 1 — Kneeling exposed, crawl to new position (good aiming point) and then fire blank. Stand up when ordered. Phase 2, 3 and 4 — Repeat of Phase 1.	**a.** Order: — PHASE 1 — COMMENCE — observers use aiming bars. **b.** At end of Phase 1 — Order: — TARGETS — STAND UP, AIs check alignment. **c.** Repeat above for the other 3 phases. **d.** Comment on ease of remembering when there are only 2 targets.
2	T	3	100 M	Same as Trial 1, except select positions which are near as possible reference point. Also space targets out over a 60 M frontage.	As for a., b., and c. above except comment that trial is harder because of increased number of targets, poor aiming points and the distance between targets.
3	C	4	300 M	Phase 1 — Spaced out over a 40 M frontage. Walk through partial cover. Disappear when fired on. Make a second rush to a good aiming point. Phase 2 — Make a 4-second rush to a good aiming point. Phase 3, 4 and 5 — Repeat Phase 2 and fire blank at end of Phase 5.	**a.** Order: — PHASE 1 — COMMENCE. **b.** After 20 seconds fire one blank. **c.** Observers use aiming bars. **d.** At end of each phase: — Order: — TARGETS — STAND UP, AIs check alignment. **e.** Repeat a., c. and d. for the other 4 phases. **f.** Comment: — Observers were probably unable to remember all the targets because of the short time they were moving, the space between them, and the number of targets. However, the aiming points were easy.
4	J	2	200 M	Phase 1 — Kneeling behind bush make 4 second rush to a poor aiming point. Phases 2 to 5 — Varied time rushes of 2, 4, 2, 3 seconds respectively. Poor aiming points. Fire blank at end of Phase 5.	**a.** Order: — PHASE 1 — COMMENCE, observers use aiming bars. **b.** At end of each phase: — Order: — TARGETS — STAND UP, seconds check alignment. **c.** Repeat above for each phase. **d.** Comment: — This was easier because two moving targets are easy to mark.

Trial No.	Location	No. of Men	Range	Description of Actions	Instructors' Notes
5	L	3	300 M	Phase 1 — Spaced out over a 50 M frontage. Lying hidden — Make 2 second rush to good or poor aiming point. Phases 2 to 5 — Varied time rushes of 4, 6, 2, 6 seconds. Good or poor aiming points. Fire blank at end of Phase 5.	**a.** As for Serial 4. **b.** Comment : — Three targets well spaced out are difficult. The exposure time varied and this complicates the task.
6	O	4	175 M	Phase 1 — Behind trees — Make 3 second lateral rush to good or poor aiming point. Phases 2 to 5 — Varied time lateral rushes of 2, 4, 3, 2 seconds. Good or poor aiming points. Fire blank at end of Phase 5.	**a.** As for Serial 4. **b.** Comment: — Targets harder to hit because movement was lateral. Probably best not to fire while target was moving.
7	B	3	275 M	Phase 1 — Start at different distances beyond 175 M and almost behind each other. Make 4 second rush to good or poor aiming points. Phases 2 to 5 — Varied time rushes of 4, 2, 3, 2 seconds. Good or poor aiming points. Fire blank at end of Phase 5.	**a.** As for Serial 4. **b.** Comment: — Observers should have remembered the location of all of these targets as they were almost behind each other. To fire at them, engage the closest and easiest targets first and then work back.
8	P	3	200 M	Phase 1 — Spaced out over a 60 M frontage. Lying slightly exposed. Crawl 5 yards to poor aiming point. Phases 2 to 4 — As for Phase 1 except select progressively harder aiming points and reference points. Fire blank at end of Phase 4.	**a.** As for Serial 4. **b.** Comment: — This trial is harder because of: (1) More targets. (2) Poor aiming points. (3) Distance between targets.

Trial No.	Location	No. of Men	Range	Description of Actions	Instructors' Notes
9	K	3	300 M	Phase 1 — Walking through trees, disappear when fired on. 4 second rush to behind another tree. Phases 2 to 5 — Varied time rushes of 2, 2, 6, 4 seconds. Vary direction of rushes. Fire blank at end of Phase 5.	a. As for Serial 4, except fire one blank 15 seconds after start. b. Comment: (1) Varied time and direction of rushes are necessary to confuse the enemy. (2) Sometimes better to make a slightly longer rush to good cover than to make short rushes which leave you exposed. (3) Remembering location was hard because there were too many good aiming points close together. (4) Observers should have remembered the location of one target very well and the general area of the other two.
10	S	4	150 M	Phase 1 — Targets well spaced. Make 4 second rush to good or poor aiming point. Phases 2 to 5 — Varied time rushes of 3, 2, 2, 3 seconds. Good or poor aiming points. Fire blank at end of Phase 5.	a. As for Serial 4. b. Comment: (1) Targets well spaced and therefore difficult to remember each target. (2) Short exposures and varied aiming points make trial difficult.

APPENDIX 5 TO ANNEX B

LESSON 13 — SAMPLE MASTER TRIAL SHEET

Notes: 1. Targets representing covering fire should be located in a tactically sound position. Moving targets should be located generally to a flank of the detection range so that their line of advance is as near as possible to an angle of 90 degrees to the covering fire.

2. If the detection range used is well covered by vegetation it may be necessary for the targets which are going to move to stand up before commencing each trial.

Trial No.	Location	Range	Description of Actions	Instructors' Notes
1	K	150 M	Two targets make clumsy 5 metres crawling movements to good aiming points. Two targets fire 4 rounds each from good aiming points. Targets within 10 metres of each other.	a. Order: — TRIAL 1 — COMMENCE. b. At end of trial order: TARGETS — STAND UP, seconds check alignment. c. Comment: Remembering was easy because all positions were at good aiming points and because firing continued throughout trial, smoke and flash could be seen after sound had indicated the general area.
2	O	200 M	Three targets crawl 5 metres, other target fires 2 rounds after movement starts. All positions at poor aiming points that require selection of reference points. 25 metres between targets.	a. As for Trial 1. b. Comment: This trial was harder because of remote reference points and the greater distance between targets. Crawling movements were better, and also, as only 2 shots were fired, it was harder to locate the firing target.
3	A	300 M	Two targets move through scrub until instructor fires one round, when they disappear and then make 4 second rushes to positions with good aiming point. Other two targets fire 4 rounds from good aiming points immediately instructor fires.	a. As for Trial 1, except that instructor fires one blank 20 seconds after trial commences. b. Comment: The targets disappeared and the covering fire began immediately. You probably were unable to remember where all the targets disappeared because of the short time of movement, the distance between them and the number of targets.

Trial No.	Location	Range	Description of Actions	Instructors' Notes
4	Z	130 M	One target makes a 4 second rush, other three targets fire 4 rounds each. All positions at poor aiming points.	a. As for Trial 1. b. Comment: The targets were easy to detect as there was only one moving target and the firing targets fired sufficient rounds for you to detect them one by one.
5	B	250 M	Two targets make two 6 second rushes to positions with good or poor aiming points. Other two targets fire 2 and 4 rounds from similar positions.	a. As for Trial 1. b. Comment: The targets were well spaced and did not disappear together. You should concentrate on the first target to disappear and then the one that is still moving. As one target fired only 2 rounds and the other fired 4 rounds they were easier to detect than if they started and stopped firing together.
6	C	125 M	One target makes 2 second lateral rush, three targets fire 3 rounds each. Positions to be varied good and poor aiming points.	a. As for Trial 1. b. Comment: In this case the movement was across your front. The target was harder to hit but easy to follow and to remember where it disappeared. You should have remembered the most dangerous firing target first.
7	P	250 M	One target makes a 6 second rush to a position without a good aiming point. Three other targets fire 1 round each from similar positions.	a. As for Trial 1. b. Comment: Firing targets difficult to detect because they fired simultaneously. Even though the moving target disappeared at a poor aiming point it was easy to remember because it was exposed for a long time and it was the only target moving.
8	K	100 M	Three targets crawl for 5 metres. One other target fires 4 rounds. Select poor aiming points.	a. As for Trial 1. b. Comment: You should have marked at least three of these targets.

Trial No.	Location	Range	Description of Actions	Instructors' Notes
9	B	300 M	Two targets walking through scrub until instructor fires, then disappear and make two 6 second rushes. Other two targets fire 2 rounds each immediately instructor fires. All select good and poor aiming points.	**a.** As for Trial 1. **b.** Comment: These targets varied the time and direction of their rush. You will frequently have to do this in advancing to new cover.
10	P	225 M	Four targets fire 4 rounds each from positions with varied good and poor aiming points.	**a.** As for Trial 1. **b.** Comment: These targets started and stopped firing at about the same time, making it difficult to remember them all. You should have detected two or three.
11	K	150 M	Two targets very well spaced make 2 second rush, two targets, one at each end of range, fire 1 round each after start of movement. Varied good and poor aiming points.	**a.** As for Trial 1. **b.** Comment: This was a hard trial because the targets were well spread and remained up for only a short period. The firing targets were at opposite ends of the range.
12	N	175 M	Three targets grouped together make 2 second rush, one target closer to observers fires 2 rounds. Varied good and poor aiming points.	**a.** As for Trial 1. **b.** Comment: Firing target is closer than the others and is more dangerous, therefore fire at it first.
13	O	150 M	One target makes 2 second rush, three targets widely spread fire 2, 3 and 4 rounds. Good and poor aiming points.	**a.** As for Trial 1. **b.** Comment. The firing targets were difficult to detect because they were widely spread and they fired a varying number of rounds.
14	D	250 M	One target fires and three others make 3, 4 and 5 second rushes resepctively to good and poor aiming points.	**a.** As for Trial 1. **b.** Comment: You should have been able to remember each moving target as he disappeared and then concentrated on the firer.

15	E	225 M	Two targets far apart make 3 second rushes to good aiming points. Two targets close together fire 2 rounds each.	**a.** As for Trial 1. **b.** Comment: You should have concentrated on the two firers as they were close together and able to fire effectively at you.
16	Z	275 M	Four walking targets disappear and then make 1, 2, 3 and 4 second rushes respectively after being fired on from the observation line. Each target to fire 1 round 2 seconds after disappearing. Select good and poor aiming points.	**a.** As for Trial 1, except instructor to fire 1 blank 10 seconds after trial commences. **b.** Comment: You should have remembered 3 targets as the firing after disappearance should have helped you.
17	C	125 M	Four targets fire 1, 2, 3 and 4 rounds respectively from varied aiming points.	**a.** As for Trial 1. **b.** Comment: As two targets fired 3 and 4 rounds you should have remembered at least two.
18	P	300 M	Two targets fire 1 round, two other targets far apart make 1 second rush. Poor aiming points.	**a.** As for Trial 1. **b** Comment: A hard trial because moving targets were fleeting and far apart and the firing targets only fired once.
19	Z	125 M	One target fires 1 round, two targets make two 3 second rushes, other target crawls for 7 metres. Good and poor aiming points.	**a.** As for Trial 1. **b.** Comment: A hard trial. You may have concentrated on the visible targets and failed to look for one crawling. The crawling target was moving well after the other indications had ceased. If you had continued your observation you would have detected this target.
20	B	175 M	One target crawls 5 metres, three targets fire 1, 2 and 3 rounds respectively. Good and poor aiming points.	**a.** As for Trial 1. **b.** Comment: The firing may have distracted you from searching the whole area, thus missing the crawling target. Always glance quickly over your arc to ensure you detect any such movement.

APPENDIX 6 TO
ANNEX B

LESSON 13 — **ANSWER SHEET**

Note: Observers check each other's alignment and place number of targets correctly aligned in the space opposite the appropriate trial number.

TRIAL No.	NUMBER CORRECT
1	. . . . .
2	. . . . .
3	. . . . .
4	. . . . .
5	. . . . .
6	. . . . .
7	. . . . .
8	. . . . .
9	. . . . .
10	. . . . .
11	. . . . .
12	. . . . .
13	. . . . .
14	. . . . .
15	. . . . .
16	. . . . .
17	. . . . .
18	. . . . .
19	. . . . .
20	. . . . .
TOTAL CORRECT	

APPENDIX 7 TO ANNEX B

SAMPLE MASTER TRIAL SHEET
TD TEST No. 2

TRIAL No.	No OF MEN	LOCATION	RANGE	DESCRIPTION OF ACTIONS
1	1	L	300 M	Kneeling by tree, stand up on command. 10 metre rush to poor aiming point.
2	4	K	200 M	Rush 10 metres to poor aiming points.
3	3	P	75 M	Rush 15 metres to poor aiming points.
4	4	B	150 M	Rush 10 metres laterally to good aiming points.
5	3	O	75 M 100 M 125 M	Each target makes a 10 metres rush. One to good aiming point and other two to poor aiming points.
6	2	A	200 M	10 metres rush. One man right, one man left, both to poor aiming points.
7	3	C	75 M	Rush 5 metres to poor aiming points.
8	2	S	300 M	One makes 5 metres rush and one makes 10 metres rush to good and bad aiming points respectively.
9	1	D	200 M	20 metres rush to poor aiming point.
10	2	E	150 M	5 metres lateral rush to poor aiming points.

Note: Target Trial Sheets are to be prepared from this Master Trial Sheet.

APPENDIX 8 TO
ANNEX B

ANSWER SHEET

TD TEST No. 2

Observer's Name ..... Detail .....

Range ..... Date .....

TRIAL No.	No. OF TARGETS PRESENTED	RIGHT	WRONG
1	1		
2	4		
3	3		
4	4		
5	3		
6	2		
7	3		
8	2		
9	1		
10	2		
	TOTAL 25		

APPENDIX 9 TO ANNEX B

SAMPLE MASTER TRIAL SHEET
TD TEST No. 3

TRIAL No.	SOUND POSITION
1	H
2	A — J
3	C — L
4	E — H
5	A
6	G
7	B — D
8	C
9	I — G
10	A — K
11	B — I
12	F — J
13	H — K
14	J
15	F
16	C — G
17	C — A
18	I
19	E — I
20	

Note: Target trial sheets should be prepared from a Master Trial Sheet similar to the one shown above, containing only the trials and positions relating to a particular target or targets.

APPENDIX 10 TO
ANNEX B

ANSWER SHEET — SOUND DETECTION
TD TEST No. 3

TRIAL No.	POSITION	RANGE(S) (METRES)	TRIAL No.	POSITION	RANGE(S) (METRES)
1			11		
2			12		
3			13		
4			14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

TOTALS: RIGHT ..... WRONG .....

OBSERVER'S NAME: .....

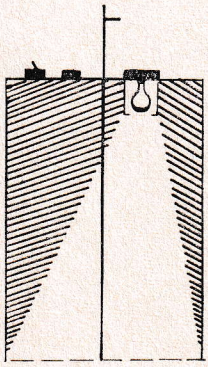
DETAIL: .....

DATE: .....

ANNEX C

THE PANORAMA BOX

Plan View



Switch
Rheostat (with pointer)
Rod for windmill vanes
or for a movable target
Light

Movable vanes

Suggested Panorama

ANNEX D

TAPED NARRATIVE

LESSON 11 — INTRODUCTION TO NIGHT WORK

1. Look around the room and see if there is any light. I can assure you that there is a light case on the white screen to your front. The light is rather intense. In fact, it is of higher intensity than that furnished by starlight. When the lights first went off, it was not completely dark in here, you just thought it was.

2. Look down to where the floor seems to meet the wall. Move your eyes slowly up the wall to the ceiling and back down again. If the image of the screen seems to move, it is a carry-over illusion that you have. Your brain sees, but your eyes do not. Close your eyes, the illusion remains. This will prove that your eyes do not see the screen.

3. The purpose of this part of the problem is to demonstrate to you the need for becoming dark adapted prior to moving out at night, and to show you that it requires an amount of time in the darkness to become dark adapted; 30 minutes are required for the average person to become 98 per cent dark adapted. Also, this phase is to show you that you must apply the other three principles in night vision, off-centre vision, scanning, and confidence.

4. You have not yet been able to see the screen to your front because your day eyes (the cone cells) are night blind; and your night eyes (the rod cells) have not yet become sensitized. Remember at night the eyes are not capable of going into action immediately. They take time to adjust.

5. Certain conditions will affect our night vision. A serious lack of certain food factors, such as vitamin A and B, will impair our night vision. However, an excess consumption of these vitamins will not proportionately increase our night vision ability. Distractions such as colds, headaches and fatigue will affect a person's night vision. Excessive use of drugs, smoking and intoxicating beverages will affect our night vision.

6. It takes an older person much longer to become dark adapted, if he becomes dark adapted at all! If exposed to brilliant sunlight, such as that in the South Pacific, your night vision will be affected for as much as a week. Therefore, you should protect yourself from this by the use of sunglasses or goggles.

7. For your work here today, I want you to imagine that you are in an observation post on a ridge line. Some 300 metres to your front is a slightly higher ridge line, and you are trying to locate objects there. You will be able to see at this greater range because you are working under very good conditions. The illumination is greater than starlight. Due to the ridge line, the objects you are trying to locate are skylined; and you have black and white contrast.

8. Many of you should be sufficiently dark adapted at this time to see the screen to your front. For those of you who do not see the screen, let me help you. Look down to the floor; move your eyes 1 or 2 feet at a time up the wall and back down again. You are scanning and attempting to locate your own particular angle of Off-centre Vision. Remember that some people become dark adapted more quickly than others. Do not worry about your seeming night blindness. It is only that your eyes have not had sufficient time to become sensitive to this low level of illumination. Shift your eyes frequently and try to determine your best angle of Off-centre Vision.

9. Those of you who see the screen should begin to see some objects on the screen. You have partially dark adapted your eyes, so this is the time to use the other three principles of night vision — Off-centre Vision, Scanning and Confidence. Keep shifting your eyes frequently.

10. Concentrate your attention now on the centre of the screen, while you practise scanning and Off-centre Vision. Your screen is the rectangle of light directly to your front and not the entire wall of the building.

11. What is in the centre of the screen? (Pause.) That's correct, it's a windmill. It appears to be standing on a slight knoll. Now look to the right and left edges of the screen and concentrate your attention on the centre of the screen. If you have not been successful, keep experimenting. Once you locate your best area in the retina, a large percentage of the difficulties of night vision should be partially eliminated.

12. Concentrate on the first object to the right of centre. What is it? (Pause.) That is correct. It is a tank. From the silhouette it gives, it is an M48 90mm gun tank.

13. Move to the left of centre. What is the first object, or objects, to the left of the windmill? (Pause.) That is correct; there are three men. They appear to be walking away from the windmill, and all three men are carrying rifles.

14. Let's go back to the right. What is the second object to the right of centre? (Pause.) That is correct. It is a 106mm recoilless rifle mounted on the carrier, the ¼ ton truck.

15. Move to the left, to the second object to the left of centre. (Pause.) What is it? That is correct; it is a 2½ ton truck. You will not be able to see this truck if you look directly at it, for when you look straight at an object you focus the object on the cone cells.

16. Shift your glance back to the right edge of the screen. What is located there? That is correct, it is a tree. The tree is fairly tall and standing alone.

17. Move back to the left edge of the screen. The man with *"very good"* night vision may be able to identify this object. It is a two-storey farm house that has been partially gutted by shell fire. Notice the large hole in the roof and the destroyed wing on the right side.

18. Has anyone detected movement on the screen? (Pause.) All right, what do you see? (Pause.) There are two aircraft, one behind the other, moving across the screen every 30 seconds. It appears as if the second is chasing the first. They are later model aircraft. The aircraft are flying from right to left. If you have not detected the aircraft do not stare at the centre of the screen. Look to the right or left of the centre. Those of you who have not been able to detect objects on your screen, do this — leave your chair in place, and move much farther away from the screen. (Pause.) It has been found that many men who cannot see the screen close up have less difficulty in seeing the screen farther away. (Pause.)

19. Gentlemen, you have had an opportunity to prove to yourselves, that by applying the principles of night vision, you can improve your ability to see at night. I am sure that you will agree that you must dark adapt your eyes before you

attempt to see at night. You have seen objects by looking away from them and at the same time concentrating on the objects. This is the second principle, Off-centre Vision. You have experienced objects fading out, and by shifting the glance, they once again come into view. This illustrates the third principle, Scanning. Practice in these first three principles will bring the fourth principle, Confidence. You are building confidence by identifying objects.

20. These four principles must be integrated into night training. These are the basic fundamentals of night vision. This training will pay off once you find out that seeing at night is no impossibility. Then, the darkness becomes a friend instead of a foe.

21. Sitting in the darkness for 30 minutes is the most common method of dark adaptation. Obviously, under non-combat conditions, this is dull and monotonous. In a combat situation, 30 minutes in the darkness would build up a large amount of tension. In the early part of World War II, during the Battle of Britain, the RAF lost many pilots when these pilots rushed from a lighted ready room to intercept already dark adapted enemy pilots. So the British had the pilots sit in a completely darkened ready room. This did not work out so well either, because the nervous strain on the pilots was such that the British lost almost as many pilots as a result of psychoneurosis and hospitalization. So the British experimented with various types of goggles for use in dark adapting pilots and in helping those pilots retain their dark adaptation. Red goggles were developed. These goggles were found to be capable of filtering all light except red light, which does not affect the sensitivity of the rod cells of the eye, and therefore does not affect the night vision of the eyes.

22. Red goggles are not the only means used to dark adapt your eyes or to preserve the dark adaptation. Red light may accomplish the same purpose.

Note: (Turn red lights on).

23. Note the effect of red light on colours, however. Look at the colour spectrum. This demonstrates another limitation of the use of red light in the dark adaptation of your eyes — care must be exercised so that mistakes will not be made when working with colours as, for example, when working with coloured maps. (*Note*: *Turn red lights off.*) Specially prepared maps must be used.

24. You can see the screen as well as you did before. This demonstrates the fact that red light can be used in CPs, or wherever light is needed, without any material effect on the dark adaptation of your eyes. Red light has been used aboard ships in chart rooms for many years to protect the dark adaptation of men going on watch.

25. Look at the screen again, and let's go over some of the things we saw before. In the centre of the screen we found a windmill situated on a knoll. Now, let's go back to the other objects on the screen. To the right of the windmill we found a tank. If you properly apply scanning and off-centre vision, you should be able to see the blast deflector of the 90mm gun. To the left of the windmill, there were three men walking with rifles on their shoulders. The second object to the right of the centre was a 106mm recoilless rifle mounted on a jeep. What direction is the gun pointing? (Pause.) That's correct, it is pointing to your left. Moving to the second object the left of centre, we discovered a 2½ ton truck. If the truck was to move forward, which way would it move? (Pause.) That's correct, it would move to your right. At the extreme right edge of the screen, we observed a lone tree. Look at the shadowgraph screen, and see if you can pick up anything you were not able to see before. Look well up towards the top of the screen, where the screen seems to meet the ceiling.

Note: *EXPLODE FLASH BULBS.*

26. Now look at the screen. You are momentarily blinded. Your eyes are clouded by the after image. This condition will last for a few seconds only. Here is what happened; the light was only on long enough to use up the surface supply of visual purple. The pupils of your eyes did not have time to contract. The visual purple is very quickly resupplied, and your vision may quickly readjust. The same dazzle phenomenon is experienced in the field by exposure to flares, gun flashes, and bomb burst. You and your men should protect your eyes from exposure to such dazzling light.

27. Consider what would happen if you were exposed to the brilliant flash of a nuclear explosion. You would not need to be looking directly at the burst to be absolutely blind for 15 to 45 minutes before you would "begin" to regain your night vision. Every effort should be made to maintain your night vision.

28. At this time I would like you to take out a handkerchief, fold it, close your left eye only, and cover that closed left eye with the folded handkerchief and hand. If you do not have a handkerchief, use your hand. Do not let any light enter your left eye. Keep your right eye open, and do not open your left eye until I tell you to do so. I am going to turn the lights on and destroy the night vision of your right eye.

Note:

AFTER MAKING SURE THAT ALL STUDENTS HAVE THEIR LEFT EYE CLOSED, TURN ON THE LIGHTS. UTILIZE SOME GIMMICK TO FILL THIS GAP. AT THE END OF TWO MINUTES THE LIGHTS ARE TURNED OFF.

29. Keep your left eye covered and closed. Note that the light has completely destroyed the night vision of your right eye. Now close your right eye and open your left eye. Note that the dark adaptation of your left eye has been preserved. Now open both eyes. (Pause.) Your right eye should be as if a heavy weight is pulling down on the lid. The muscles of the right eye are trying to compensate by adjustment for the inability of the right eye to see. The pupil of the right eye is smaller than the pupil of the left eye.